# UNITED STATES DISTRICT COURT
# FOR THE NORTHERN DISTRICT OF
# NEW YORK

CASE NO: 1:16-CV-1490
DATED August 7, 2017

## GRAND JURY REPORT REGARDING CRIMINAL INVESTIGATION

Grand Jury Report Attached - 254 pages, filed via US Mail with the Court Clerk on August 8, 2017, with File on Demand.

Copied: President Trump
Attorney General Sessions
Senator Chuck Grassley
U.S. Representative Trey Gowdy
Magistrate

# UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF NEW YORK

• 445 Broadway; Albany, NY. 12207-2936 •

**Unified United States Common Law Grand Jury;** **Sureties of the Peace**

P.O. Box 59, Valhalla, NY 10595; Fax: (888) 891-8977.

AL, AK, AZ, AR, CA, CO, CT, DE, FL, GA, HI, ID, IL, IN, IA, KS, KY, LA, ME, MD, MA, MI, MN, MS, MO, MT, NE, NV, NH, NJ, NM, NY, NC, ND, OH, OK, OR, PA, RI, SC, SD, TN, TX, UT, VT, VA, WA, WV, WI, WY:


Grand Jury, Sovereigns of the Court
We the People

- Against -

Undisclosed (sealed)
Defendants

Jurisdiction: Court of Record, under the rules of Common Law
Action at law:

Case NO: 1:16-CV-1490
Magistrate: Daniel J. Stewart

**EVIDENCE REPORT**

# GRAND JURY REPORT REGARDING THE CRIMINAL INVESTIGATION INTO 911

## AUGUST 7, 2017

On September 11, 2001, the three worst structural failures in modern history took place when World Trade Center Buildings 1, 2, and 7 suffered complete and rapid destruction. In the aftermath of the tragedy, most members of the architecture and engineering community, as well as the general public, assumed that the buildings' destruction had occurred as a result of the airplane impacts and fires. This view was reinforced by subsequent federal investigations, culminating in FEMA's 2002 Building Performance Study and in the 2005 and 2008 reports by the National Institute of Standards and Technology (NIST).

Since 9/11, however, independent researchers around the world have assembled a large body of evidence that overwhelmingly refutes the notion that airplane impacts and fires caused the destruction of the Twin Towers and WTC 7. This body of evidence, most of which FEMA and NIST omitted from their reports, instead supports the troubling conclusion that all three skyscrapers were destroyed in a process known as "controlled demolition," where explosives and/or other devices are used to bring down a building.

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# KEY VIDEO EVIDENCE, CD ATTACHED (*with youtube links*)

1 Experts Speak Out - Introduction
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5 WTC7 Part 4 Fully Engulfed in Fire Experts Speak out
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(DVD- (entitled
Grand Jury 911
Investigation Video)

The following articles discuss and analyze the evidence for explosive controlled demolition of the Twin Towers and WTC 7. While most of these articles are intended for a general audience, the articles under "Technical Critiques of the NIST Reports" are geared toward readers with greater technical knowledge.

# 60 Structural & Civil Engineers Cite Evidence for Controlled Demolition in Collapses of All 3 WTC High-Rises on 9/11

*How could all 47 core columns fail at the same instant? Fires could not do that.*

## *Official Collapse Theory Defies All Laws of Physics*

By James McDowell and AE911Truth Staff

Since its inception in 2006, Architects & Engineers for 9/11 Truth has remained steadfast in its mission of exposing the flaws in the claims made by the National Institute of Safety and Technology (NIST) — namely, that the impact of two planes and the resulting fires brought down three steel-framed skyscrapers on September 11, 2001. We do scientific, cogent, and comprehensive analyses, backed by forensically-tested, unassailable facts.

One outcome of our insistence on remaining true to our mission is that our ranks of signatories has swelled from less than a dozen to more than 2,300 building and technical professionals who are petitioning the government for a new, independent investigation of the catastrophic destruction at the World Trade Center on 9/11.

Additionally, over 20,000 citizens have signed the AE911Truth petition, and more than 250,000 supporters have "liked" our Facebook page. Last August we introduced this once-taboo topic with a 45-minute interview on C-SPAN, foiling a mainstream media blackout and allowing a national audience of millions to finally hear the most poignant — and suppressed — facts about that fatal day.

While much of AE911Truth's success can be ascribed to the perseverance of its founder and the other members of its board of directors, who have remained focused on the science, none of its achievements would have been possible without the professional credibility lent by an ever-growing contingent of professional signatories: structural engineers. The members of this distinguished group, numbering 60 to date, are experts in the capability of steel-frame structures to resist all kinds of forces. Their courage in stepping up to speak the "inconvenient truth" secures for them a venerable place as "the scientific backbone" of AE911Truth.

Five years after 9/11, San Francisco Bay Area architect Richard Gage, AIA, began raising technical questions among his professional colleagues about the destruction of the Twin Towers and 47-story WTC Building 7. He realized that an organized effort by building professionals and scientists was needed to shine light on the government's false version of 9/11. In the years since founding AE911Truth, Gage has discovered that those who take time to look at the facts overwhelmingly agree that vital questions about the forensic evidence and

video testimony remain unanswered by government officials.

That's why he and more than 2,300 other degreed and/or licensed architects and engineers — including 60 structural engineers who hail from the US, Canada, Australia, the UK, and Europe — have signed the petition that demands an unbiased, unimpeachable investigation of the World Trade Center's destruction. Every day, more professionals — all of them carefully vetted by AE's verification team — join the existing signatories.

## *For Some, the Doubts Began Early*

"Something is wrong with this picture," thought **Nathan Lomba, S.E., P.E., of Eureka, California,** as he watched televised replays of the Twin Tower collapses on September 11, 2001. As a licensed structural engineer trained in buildings' responses to stress, Lomba saw more on the screen than did the average viewer. He tried to answer this perplexing question, "How did the structures collapse in near-symmetrical fashion when the damage was clearly not symmetrical?"

Lomba was hardly alone in his doubts and discomfort that day. Whether they publicly admit it or not, and whether they saw the events unfold "live" or watched endless television and internet reruns later, most building professionals — or individuals with any knowledge of building collapses — were surprised when the towers fell. Demolitions expert Van Romero voiced his thoughts the day the planes struck, though he unaccountably reversed his position ten days later. Also early on, MIT engineer and research scientist Jeff King made his first impressions of 9/11 known in this speech. Even TV anchors (see here and here, for example) expressed their unfiltered opinions on the air that fateful day.

**How did the structures collapse in near-symmetrical fashion when the damage was clearly not symmetrical?**

By and large, though, building professionals kept their misgivings to themselves. In the ensuing days, weeks, and months, they watched in bewilderment as reputable magazines like *Scientific American* and the *Journal of Engineering Mechanics*, well-regarded television stations like the BBC and The History Channel, and government agencies including NIST and the Federal Emergency Management Agency (FEMA) trotted out varying and imaginative hypotheses as to how fires could have leveled all *three* high-rise structures.

Many structural engineers, like Lomba, find the unnatural symmetry of the fall of all *three* skyscrapers highly suspicious. The rapidity of collapse — eventually acknowledged by NIST as free-fall acceleration — also troubles them. Some note that the fires were weak, low-temperature, and short-lived. Others ask how the tilting upper section of the South Tower, WTC 2, "straightened" itself. Everywhere they look, pieces of the puzzle "don't fit with what we've been told," these engineers insist.

New evidence that has come to light over the years but was omitted from government reports — dozens of eyewitness testimonies of explosions, unexplained molten iron in the debris pile, and chemical evidence of steel-cutting incendiaries — has only validated these engineers' initial suspicions.

More than a few of them also point to the implausible aspects of civil engineering professor Zdeněk Bažant's pile driver model, first published a mere two days after 9/11, which these

engineers view as a rush to judgment based on extremely limited data, and later codified in his 2008 analysis.

They also cite the impossibilities — as well as slipshod and dishonest methodology — of both the 2002 FEMA report and the NIST final reports on the Twin Towers (2005) and Building 7 (2008).

Mystifying many of these professionals is the abrupt fall, in the late afternoon of 9/11, of WTC 7, which was not hit by an airplane but only by debris ejected from the North Tower when it came down. The repeated postponement of the government's reports only added figurative fuel to the fire, in the minds of many a skeptical engineer.

## *Artificial Symmetry*

The symmetry of collapse struck **both Paul Mason, a structural engineer in Melbourne, Australia,** and **Dennis Kollar, P.E., a structural engineer in Wisconsin**, as disconcerting. Kollar remains troubled by the "totality and uniformity of the destruction" and by the fact that "the mass of debris remained centered on the building core all the way down."

**John Watt, a chartered structural engineer in Edinburgh, UK**, voices similar concerns. "With respect to the Twin Towers," he says, "the main puzzle was how two buildings with highly asymmetric damage could fail vertically downwards into the strongest part of the buildings — their steel-columned cores. And not only fail vertically, but at a speed that indicated structural resistance being removed sequentially from under the collapse wave. Few engineers would imagine buildings a quarter-of-a-mile high failing vertically, into their main structures, rather than failing laterally — given the eccentric damage."

The towers should have fallen "with increasing eccentricity as the collapse progressed," observes **Howard Pasternack, P.Eng., of Toronto, Canada.** Moreover, these systematic collapses required that many structural connections not only fail "nearly simultaneously, but also in sequential order," according to **Frank Cullinan, P.E., who designs bridges in Northern California.** That's "impossible from asymmetrical impact loading and . . . small, short-duration fires."

The engineers find it difficult to believe the government's claim that scattered fires brought about such an orderly collapse. Failure of heat-weakened steel would show "large deflection, asymmetric local failure, and slow progress," **David Scott, C.Eng., a chartered consulting structural engineer in the UK,** told colleagues at the Institution of Structural Engineers in the UK. It's "a *gradual* process," agrees Anders Björkman, and "cannot be simultaneous everywhere." A Swedish naval architect and marine engineer working in France, Björkman maintains that failures "will always be local and topple the mass above in the direction of the local collapse."

**William Rice, P.E., a Vermont licensed structural engineer,** expects fire-induced failures to be "tilting, erratic and twisting," while **Ronald Brookman, S.E., a licensed structural engineer in Novato, California,** figures on "a partial collapse to the side."

"Symmetrical collapse requires simultaneous failure of all supporting columns," notes **Charles Pegelow, P.E., a Houston, Texas, licensed civil engineer** who has performed

design work on numerous tall buildings as well as oil rigs. "How could all 47 core columns fail at the same instant?" Pegelow wondered briefly, then concluded definitively, "Fires could not do that."

### *Impossible Collapse Acceleration*

After NIST characterized the Twin Towers' collapse as "essentially in free fall" (See Section 6.14.4 of NIST NCSTAR 1, page 146 [PDF page 196]), Brookman wrote to NIST investigators, asking why debris fell "with little or no resistance from the intact structure below."

And, though Rice didn't address NIST directly, he, too, questioned — and continues to question — how each tower "inexplicably collapsed upon itself, crushing all 287 columns on each floor, while maintaining near-free-fall acceleration, as if the 80,000 tons of supporting structural steel framework underneath didn't exist."

Falling objects, notes Pasternack, should take "the path of least resistance," yet official explanations claim that tower debris took the path of *greatest* resistance, through the strong core structure all the way to the ground.

The Twin Towers were overbuilt to prevent office workers from getting seasick on windy days, says Kollar. "There's so much redundancy. . . . The building has to be stiff enough so it doesn't sway [excessively]." Perimeter columns designed to endure hurricanes, Scott says, were loaded only to "about 10% of their ultimate capacity" in the gentle breeze on 9/11. (See "How Columns Will Be Designed for 110-Story Buildings," *Engineering News-Record,* April 2, 1964.)

Gravity was "a negligible part of the loading," says Kollar, citing a claim by the Twin Towers' engineers Worthington, Skilling, Helle & Jackson that even with all the columns on one side — and several around the two corners — cut, each tower would still withstand 100 mile-per-hour winds. (See James Glanz and Eric Lipton, *City in the Sky: The Rise and Fall of the World Trade Center*, New York: Times Books, 2003.)

The rapid breakup of these robust structures appears to defy the laws of physics, AE911Truth engineers say. Fifty years of structural design experience inform the view of **Santa Rosa, California, licensed structural engineer Bob Briscoe, P.E.,** who maintains that the government's collapse theories "defy the laws of mechanics, conservation of energy, and known structural failure behavior."

In the official collapse story, the kinetic energy (of motion) of the falling debris would have been largely absorbed by the existing structure, bending and twisting steel components, and breaking up 220 acres of concrete floors. To accomplish all this while achieving a nearly free-fall collapse is "simply not physically possible," says Mason. "There is not sufficient energy available . . . . For this massively strong structure to just crumble away at near-free-fall acceleration would have required immense amounts of explosive energy."

### *Weak Fires vs. Explosive Events*

Though four official accounts blame fire for the destruction of all *three* World Trade Center towers, the fires do not appear to have been particularly severe, the engineers contend. In fact, even NIST states that the jet fuel burned off in just minutes. (See NIST NCSTAR 1, page 183 [PDF page 233].)

The government agency even "acknowledged that office furniture burns up in only about 20 minutes in any one area" before it's consumed, Scott points out. "There's ample evidence that the steel temperatures got nowhere close to the "600+ degrees Centigrade [1,200 degrees Fahrenheit] required to initiate failure." (See NIST NCSTAR 1, page 129 [PDF page 179] and page 183 [PDF page 233].)

### *That does not look anything like a heat-induced, gravitational collapse mechanism*

We saw no "raging infernos" on TV, notes **David Huebner, P.E., a licensed structural engineer in Michigan.** On the contrary, sooty smoke and dull red flames indicate "cool fires . . . fuel-starved fires," says Scott. He adds that firefighters working at the 78th-floor impact zone reported "only two small fires, not the 1,000-degree-Centigrade inferno" that government officials claim.

New York Fire Department (FDNY) personnel, trained to assess fires' structural hazards, had no reason to expect total collapse, Brookman maintains. In fact, Scott notes, several steel-framed towers have burned longer, hotter, and much more intensely without collapse. "As engineers, we know what fire can do to steel and what it can't."

"Over 100 recorded witnesses reported hearing and seeing multiple explosions," Rice recalls.

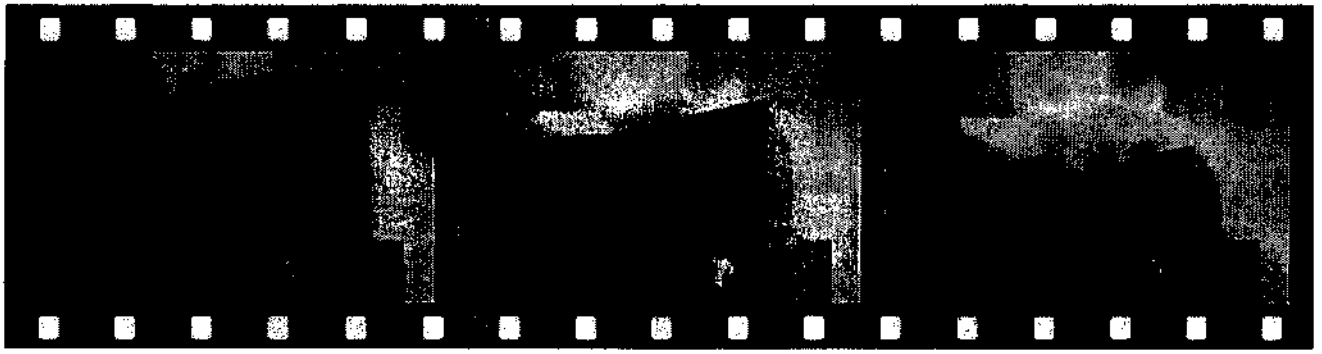
Brookman, too, cites "numerous eyewitness accounts, including the FDNY oral histories, of secondary explosions . . . well below the impact floors." His letter to congressional representatives describes "explosive clouds of dust and debris moving horizontally and vertically." "That does not look anything like a heat-induced, gravitational collapse mechanism," Brookman writes. Rice, noting that "perimeter columns weighing several tons each were ejected laterally up to [600] feet," contends that this phenomenon is "not possible without explosives."

### *Angular Momentum Arrested*

As the South Tower began to fail, the top 29 stories tipped as a unit, photos show. "The tilting block doesn't look right," Brookman asserts. It should "continue to rotate and fall to the ground." **Phoenix, Arizona, licensed structural engineer Edward Knesl, S.E.,** and Lomba echo Brookman. The failure mode of such tall structures should have been "a fall over to the side" (Knesl) and "a toppling of the upper floors to one side, . . . not a concentric, vertical collapse" (Lomba). "It looked like an explosive event," adds Brookman. "[The upper section] began tilting toward the damage zone, and then suddenly dropped straight down and disintegrated in the process."

### *Building 7's Mystifying Implosion*

Baffling as the towers' "collapses" were, even more perplexing to the 60 structural engineers was the destruction of World Trade Center Building 7. "Unprecedented," says Rice. "Unexplainable," vouches Huebner. After all, as all the engineers know, and as **London chartered structural engineer Graham Inman** declares bluntly on their behalf, "No plane hit this building."



[redacted] Few Americans have given any thought to the *third* World Trade Center high-rise destroyed on September 11th, since it, unlike the Twin Towers' destruction, was not repeatedly televised. **Fremont, California-based Kamal Obeid, S.E., a consulting licensed structural engineer,** ponders the fall of the third high-rise structure. "A localized failure in a steel-framed building like WTC 7 cannot cause a catastrophic collapse like a house of cards without a simultaneous and patterned loss of several of its columns at key locations within the building," he contends.

Videos of Building 7 show "simultaneous failure of all columns," says Inman, "rather than [the expected] phased approach," in which undamaged columns would show resistance sequentially.

Though the 47-story building housed "offices of the CIA, the Secret Service, and the Department of Defense, among others," Rice notes that the 9/11 Commission left WTC 7's collapse out of its report. FEMA's 2002 inquiry blamed WTC 7's collapse on fires, though it admitted that its "best hypothesis [fire] has only a low probability of occurrence." The mainstream media, says Rice, have "basically kept the collapse of WTC Building #7 hidden from public view."

## *The Phantom Pile Driver*

A mere two days after 9/11, Dr. Zdeněk Bažant, a civil engineering professor at Northwestern University, offered a highly stretched rationale for the most catastrophic structural failure in history. Thirteen years later, his thesis (see Bažant's 2008 final analysis) remains the key support for the government's claim that the collapses were "inevitable." (NIST used the word "inevitable" in its NCSTAR 1 report on WTC 7 twice — once on page xxxvii [PDF page 39], footnote 2, and again on page 82 [PDF page 132], footnote 13.)

Bažant's mathematical model of the upper floors' transformation into a "pile driver block" free-falling one story to hammer the entire tower down to the ground involves "very misty allegations — actually inventions," says Björkman. His opinion derives from 40 years in ship surveying and construction, design of tankers and seagoing ferries, and practical observations of steel vessels after collisions. Never before, Björkman notes, has "a smaller object (the light-weight, upper, actually non-rigid, flexible steel structure consisting of many smaller parts) destroyed the bigger and stronger other object (the complex steel structure below) only with the assistance of gravity."

Björkman scoffs at Bažant's mythical free-falling top block bringing 287 columns hammering down in perfect array on the 287 columns below. Steel bends and mashes in Björkman's salty world, and "it is not certain that the hammer even hits the nail." Real-life columns miss, lodge in horizontal structures, and punch holes in floors, creating energy-absorbing frictions, deformed steel, local failures, and "a soft collision (not impact!)" that tangles damaged floors in a shuffled array — and stops well short of total collapse.

The marine engineer maintains that videos show Bažant's *alleged* pile driver disintegrating "within 3.5 seconds after the roof starts to fall, . . . before global collapse starts!" Björkman challenges Dr. Bažant and his followers to produce a "timetable, analysis, and explanation" consistent with the video evidence. "And tell us . . . what happened to the upper block?!"

## *Molten Iron "Flowing Like Lava"*

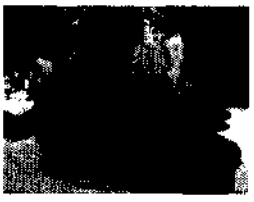
**As far as Watt is concerned**, the most compelling evidence for controlled demolition is the numerous reports of molten steel. "These came from firemen and rescue personnel involved in the initial rescues immediately after the collapses then many weeks after the collapses, where red-hot molten steel was noted. From extensive research into office building fires, we know that while steel can deform under office fire temperatures, it comes nowhere close to melting. If steel had melted due to fires at the high levels, we would again expect a tilting failure, not vertical collapse."

Steel starts melting at 2,700° F, almost 1,000° hotter than burning jet fuel or office fires, notes Pegelow. "Why did the NIST investigation not consider reports of molten steel in the wreckage?" he asks. FDNY Captain Philip Ruvolo reported seeing "molten steel . . . like you were in a foundry, like lava."

Even Leslie Robertson, one of the design engineers of the World Trade Center and a supporter of the official collapse story, acknowledged, "So when we were down at the B1 level [basement level 1], one of the firefighters said, 'I think you will be interested in this . . . .' And they pulled out the big block of concrete, and there was like a little river of steel . . . flowing."

According to Richard Garlock, a structural engineer in Robertson's firm, "Going below . . . the debris past the columns was red-hot, molten, running."

Dr. Abolhassan Astaneh-Asl, another supporter of the official story and the first structural engineer given access to the WTC steel, told PBS, "I saw melting of girders in [the] World Trade Center."



Jet fuel cannot melt steel, but, asserts Rice, "thermite incendiaries can . . . create temperatures in excess of 4,000 degrees Fahrenheit, "instantly melting/severing short segments of steel columns and beams." Chemical evidence of thermite found in the powdered debris by physicist Dr. Steven Jones is cited by Rice, by Obeid, and by Clark Townsend.

Brookman challenges NIST to explain tiny "iron-rich spheres found in the WTC dust," which appear to be solidified droplets of once-molten iron.

## *Crucial Evidence Survives Discredited 2002 FEMA Report*

The FEMA 403 report was "incomplete at best and a cover-up at worst," says an anonymous East Coast AE911Truth petition signer and structural engineer whose name is being withheld by request. He notes that the report's Appendix C.2, found "evidence of a severe high temperature corrosion attack on the steel . . . with subsequent intergranular melting" forming a "sulfur-rich liquid" that "severely weaken[ed]" the structural steel.

Later in the same report (Appendix C.6), FEMA scientists added that "no clear explanation for the source of the sulfur has been identified." The East Coast engineer finds FEMA's dodge unacceptable: "The report has uncovered an unexplainable phenomenon [within the context of the official story] that may have led to the collapse of the three WTC buildings. FEMA has stated that further study is needed, yet none has been commenced."

Several of the structural engineers are outraged that evidence has not just been ignored; it was destroyed by officials. Destroyed evidence caused firefighters to riot at Ground Zero in protest of how the dead were being desecrated by the hasty "scoop and dump" clean-up of the structural steel debris.

"The destruction of the crime scene evidence is inexcusable," Huebner holds. Scott laments the "mass of vital forensic evidence" lost. Even editor-in-chief Bill Manning of *Fire Engineering* magazine called FEMA's investigation "a half-baked farce."

Steel components were stamped with identification numbers that would have aided their reassembly for study, but that reassembly never took place. Brookman asks, "Why was the steel . . . not thoroughly examined by fire-safety and structural experts before being shipped to Asia for recycling?" Pegelow charges that "FEMA hampered and distorted the investigation," citing Dr. Abolhassan Astaneh-Asl's complaints in 2002 to the House Committee on Science that FEMA held back essential engineering drawings and videotapes and photographs.

Such flawed methodology was accompanied by inadequate theories that "cannot explain the loss of the cores," Scott points out. He says FEMA's notion that floor connections all failed simultaneously at the outer wall and at the core is "not plausible." **Bill Genitsaris, a structural engineer based in Melbourne, Australia,** believes that a pancake-style collapse "should have left the supporting columns standing." Such a collapse would have left 110 shattered floors in the building footprint below. Yet only very small floor sections were found, and not many of them.

"Where are the columns?" asks **licensed structural engineer Lynn Affleck, P.E., of Las Vegas, Nevada.** "As the tallest buildings in the world at the time, they would have to have had huge steel columns to carry all the loads, wind, and earthquake forces. In the design of such premier buildings, they would have used the latest technology codes. It would be my assessment that the flanges on the columns would have to be two inches thick or some equivalent. Perhaps it might be possible that the building floors would pancake down, but the huge steel columns would be left protruding out the top as the floors went down. In such an event, [one would] be able to see columns located somewhere in the floor plan, which were continuous all the way down to the ground."

Deceptive presentation has further damaged FEMA's credibility in the eyes of these engineers. **Thomas Lackey, P.E., of Stowe, Vermont, a licensed structural engineer who designs bridges for the Vermont Agency of Transportation,** cites the Minneapolis River Bridge collapse study as the "kind of analysis and straightforward explanation" the WTC investigation needed.

FEMA's reports are so poorly done that some of its graphics "omit the cores altogether," says Scott. Other graphics depict columns half as wide and twice as far apart as they actually were. Scott decries such "attempts to distort important technical information." The Australian engineers use more colorful terminology: We have been "taken for suckers" (Mason) and "stooged" (Genitsaris).

## *Truncated and Fudged Computer Model Undermines 2005 NIST Report*

By those who haven't read its 10,000 pages, NIST's $20 million report is generally believed to explain how fires and plane impacts destroyed the WTC. Then there are those, such as the AE911Truth structural engineers, who *have* read the entire report and who know that, as Brookman points out, it "not only fails to explain why and how the towers completely collapsed, but it states that the collapse became inevitable, without any further explanation." He asks why NIST considered conservation of energy and momentum principles "only up to the moment prior to collapse."

Scott makes the same complaint: NIST "stopped its computerized models before the onset of collapse. No work was done to calculate what happened during the actual failure. Why are we content with this?"

Sums up Brookman: "The complete collapse mechanism . . . cannot be 'omitted for brevity' in any comprehensive analysis."

## *NIST's Report on WTC 1 and WTC 2*

NIST's claim that a kinetic gravitational "attack" exceeded the WTC buildings' reserve strength is not supported by any calculations or "by any evidence whatsoever or any serious structural analysis," declares Björkman.

Equally troubling, while NIST fails to show essential work on central issues, its numerous volumes are packed with distracting trivia. Huebner, whose thirty years of structural engineering experience includes forensic investigation of structural collapses, compares NIST's effort to a "college paper where you just keep adding [stuffing] to make the paper longer. Lots of pages of nothing! Definitely trying to cover up something."

### They'd simply adjust the input until the desired outcome is achieved

When Brookman asked NIST investigators to explain the "complete pulverization of building materials and contents" and "visibly explosive clouds of dust, ash, and debris," he received no reply. "I believe in the laws of physics," reasons Brookman, "and rely on them every day." NIST's reports, however, chimes in fellow engineer Pasternak, "seem to require multiple leaps of faith in highly improbable events."

"Computer models using NIST's best estimates of temperature and damage could not even generate a collapse," Scott points out. They'd "simply adjust the input until the desired outcome is achieved." He

believes NIST probably overestimated core column damage, almost certainly overestimated steel temperatures, and definitely overestimated damage to fire protection. Such an important inquiry should, Scott suggests, "rely on logical deduction, reason and first-principle analysis, not circular reasoning and adjusting models to get agreement with a preconceived explanation."

### *47-Story Building 7's Freefall Defies 2008 NIST Report*

"We've had trouble getting a handle on building No. 7," acknowledged NIST's 9/11 lead investigator Dr. Shyam Sunder to *New York Magazine* in 2006. That "trouble" is clearly reflected in NIST's 2008 final report on WTC 7, which blames one buckling column, number 79, for the building's global and near-symmetrical collapse, yet characterizes its fires as "normal office fires," which typically burn only 20 minutes or so in any given location before moving on.

**David Topete, S.E., a San Francisco licensed structural engineer,** asks why no other nearby buildings collapsed, when some of them were much more severely damaged by fire and Twin Tower debris than was Building 7.

Obeid rejects the official hypothesis that one failing column could cause adjacent columns to come down in such robustly designed buildings. "It is not possible for a local failure within the lower structure to spread horizontally," he objects. "Such a failure would cause a break-away . . . instead of pulling the structure with it." Even if NIST's horizontal progression were somehow triggered, Obeid says, "the building would not have collapsed so neatly and symmetrically. All core columns have to be severed at the same time to make such a collapse."

### *Disturbing Questions that Must Be Answered*

"To preserve America's unprecedented freedoms, we must pursue the truth," reasons **Santa Rosa, California, licensed structural designer Clayton Simmons, P.E.** He admits to being troubled by "my profession's involvement [i.e. the ASCE endorsement of the official story] in this apparent cover-up and the media's refusal to address these critical questions."

"Some years ago," adds Affleck, "the media seemed to serve the purpose of keeping the government honest. Things would get reported and the government would have to scramble to explain. But [these days] the big media seems now to be the mouthpiece for the government."

Watt agrees. "The evidence for molten steel has been officially denied so far. The evidence of many, many witnesses to explosions has been ignored. The evidence for explosive residues in 9/11 dust has never, to my knowledge, been officially investigated. And no coherent collapse mechanisms have been officially proposed. The silence on these matters is deafening."

Scott, too, expresses consternation that structural engineers' response "has been amazingly muted," even "uninterested."

**Structural engineer Charles Walker** sums up the common stance held by his colleagues: "They understand the truth yet have been unwilling to speak out against NIST's fraudulent claims, adopting instead passive postures such as 'Don't rock the boat. Ignorance is bliss.'"

Rice observes that citizens aren't the only ones who lack interest in ferreting out the facts of 9/11: He has also found politicians remarkably blasé.

Many people "remain willfully ignorant," posits Genitsaris. "They believe that 9/11 does not affect their lives . . . regardless of the fact that our freedoms are being taken from us." Perhaps so few are questioning, Brookman says, because it's "painful to look directly at the events and consider the implications." Affleck asserts, "Engineers and architects are being discounted as though they are ignorant. The official report and the way the media handled the 9/11 incident is basically an insult to the engineering profession."

**Toronto-based structural consultant William Acri, P.Eng.**, believes that the engineer's oath "to hold public safety above all else" demands that the members of his profession speak up.

Indeed, if three modern steel high-rises really underwent total progressive collapse in less than two hours of relatively small fires and some damage to the fireproofing, seconds Scott, "we need to understand WHY!"

And, adds Inman, if WTC 7 failed from, substantially, a localized fire event, why didn't the owners and insurers sue the designers? "Either the building design was criminally faulty or other causes not related to the structural design or fire" brought down WTC 7, he concludes.

Watt points out that the question of how three steel-framed multi-story buildings collapsed "is still, officially, an open question." He goes on to say, "In a world of ever-increasing safety rhetoric and legislation, it is astonishing to professional engineers that there has not been a forensic investigation into the mechanisms of these collapses. Any aircraft suffering a catastrophic structural failure is subject to scrupulous investigation to help prevent recurring accidents and yet, in spite of these building structures being replicated all over the world, we have seen no significant structural changes in steel-framed buildings. The implications of this are deeply concerning to professional engineers interested in the safety of their designs."

## *Why Should Science-Based Forensic Evidence Be Taboo?*

The structural engineers we spoke to are calling for a new investigation into the catastrophic destruction of the three World Trade Center high-rises on September 11. "The implications of the controlled demolition evidence as outlined on our website are staggering," says Gage, speaking on behalf of the group's architects and engineers. "We therefore invite all Americans to examine the science-based forensic evidence very carefully and come to their own conclusions."

Lomba's conclusion, drawn from his initial perceptions and validated by subsequent developments, is clear: "Even if, for the sake of discussion, we accept the hypothesis that the fire protection was damaged and the fires somehow weakened the steel frames, that still does not explain the relatively concentric nature of the failures."

Scott challenges his fellow structural engineers: "The building performance on 9/11 matched controlled demolition. It does not match fire-induced collapse. We have the expertise to discern this. Do we have the courage to broadcast it?"

ARCHITECTS & ENGINEERS for 9/11 TRUTH

# Focus On: World Trade Center 7

**September 2009**

# Evidence for the Explosive Demolition of World Trade Center Building 7 on 9/11

## Introduction

Architects & Engineers for 9/11 Truth (AE911Truth) is a non-partisan, non-profit organization now numbering over 700 technical professionals and thousands of other supporters dedicated to revealing factual evidence about the violent destruction (often mistakenly called "collapses") of all three World Trade Center (WTC) high-rises on 9/11.

We are calling for a new independent investigation with subpoena power. We present here well-documented facts that support the conclusion that WTC Building 7 was destroyed by explosive controlled demolition. We ask that you set aside any pre-judgment, bias, or fear that might keep you from evaluating these facts objectively, and let the chips fall where they may. Most building professionals who review this evidence agree with our conclusions and sign our petition which is available on our website, AE911Truth.org.

Their concerns are most quickly and easily understood through a review of the evidence surrounding the third-worst structural failure in modern history—World Trade Center Building 7—and how that evidence was mishandled by the National Institute of Standards and Technology (NIST), the federal agency last tasked with explaining the unprecedented destruction of the World Trade Center.

## World Trade Center Building 7

WTC 7 was a 47-story steel-framed fire-protected high-rise that was a football field's length from the WTC North Tower and was the third high-rise to be destroyed on 9/11.

It was not hit by an airplane, yet it collapsed anyway at 5:20pm in the afternoon, rapidly, evenly, and completely. The official story, according to NIST, is that WTC 7 collapsed due to "normal office fires" which created a "new phenomenon" in high-rise catastrophes: destruction due to thermal expansion of the

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beams leading to the progressive collapse of 9 floors. This ultimately caused the failure of column #79 – the first one to fail – followed by all the rest.

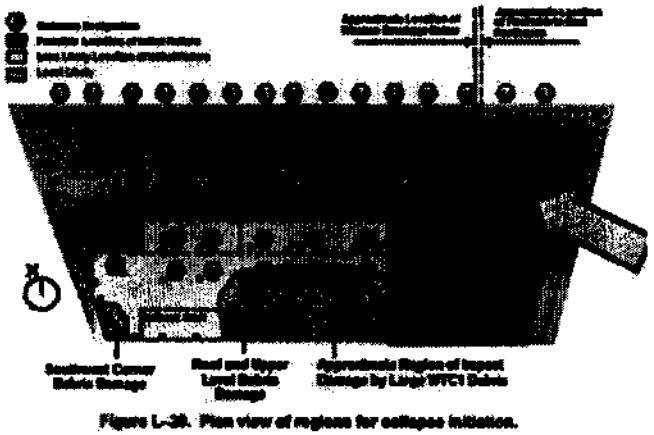

Figure 1: 24 columns removed within a fraction of a second - by fire?

Some had speculated that stores of diesel fuel in the building might have produced exceptionally intense fires leading to collapse, but NIST has officially acknowledged that diesel fuel was not involved. NIST also concluded that the impact of debris from the North Tower was not a significant contribution to the collapse of WTC 7 (other than starting the fires). What NIST's top engineers fail to explain in their Final Report, or in some cases to even acknowledge, is the many features of the destruction that are seen only in controlled demolitions.

## WTC 7's "Collapse" Displayed Features Never Seen Outside of Controlled Demolition

In every respect for which we have evidence one way or the other, the destruction of WTC7 was indistinguishable from a classic controlled demolition.

### • *Speed of Collapse*

WTC 7 descended at free-fall acceleration over 2 seconds for a distance of over 100 feet – at least eight stories. NIST initially denied the fact of free-fall in its final draft report released in August 2008. In the technical briefing that followed, NIST's lead investigator, Shyam Sunder explained, "A free-fall time would be an object that has no structural components below it." He claimed that WTC7 took 40% longer than "free-fall time" to collapse, "and that is not at all unusual because there was structural resistance that was provided in this particular case. And you had a sequence of structural failures that had to take place and everything was not instantaneous."

However, physics instructor and AE911Truth associate David Chandler had used network television videos to carefully measure the acceleration of the building during its fall and shown conclusively that a significant period of free-fall was an indisputable fact. He publicly challenged NIST's claims at the technical briefing. Along with several others, he filed formal requests for corrections during the public response period.

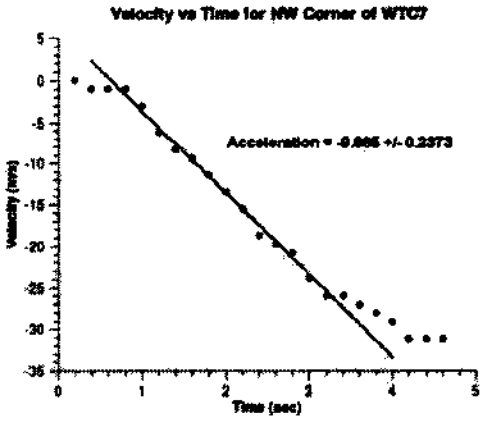


Figure 2: WTC 7 in free-fall for 8 stories

In its final report NIST reversed itself on its denial of free-fall, but it couched its revised statement in deceptive language and failed to address how free-fall could be compatible with its fire-induced progressive collapse analysis. For the observed straight-down collapse, a thick network of heavy steel columns and beams, had to be forcibly removed and more than 400 structural steel connections had to fail per second, evenly all across each of the eight floors involved. These failures had to occur *ahead* of the collapsing section – NOT caused by it – because a free-falling object cannot exert force on anything in its path without slowing its own fall.

Yet NIST's admission of the fact of free-fall, together with Shyam Sunder's acknowledgment of the simple meaning of that fact, led to no reconsideration of its fire-induced, single-column-initiated, progressive collapse hypothesis. Moreover, in what looks like an attempt to bury the discussion, its change of stance on the question of free-fall was omitted from the list of changes in its final report.

### • *Symmetry*

The overall building mass fell uniformly and with almost perfect symmetry through what should have been the path of greatest resistance – 40,000 tons of structural steel. This requires a precisely timed patterned removal of critical columns – which office fires, a gradual organic process, is not capable of. Only a carefully engineered implosion could cause this 47-story building to collapse in on itself – and land mostly within its own footprint. After all, demolition companies are paid large sums to accomplish this feat, and only a few can do it with tall buildings. Also, the destruction was complete. The building had been built especially strong so that alternate floors could be removed in case a tenant needed an extra tall space. Yet its forty-seven stories were reduced, in less than seven seconds, to about four stories of debris – like a house of cards – with the virtually complete dismemberment of the steel skeleton, including both braced and welded moment-resisting (bend-resistant) frames.

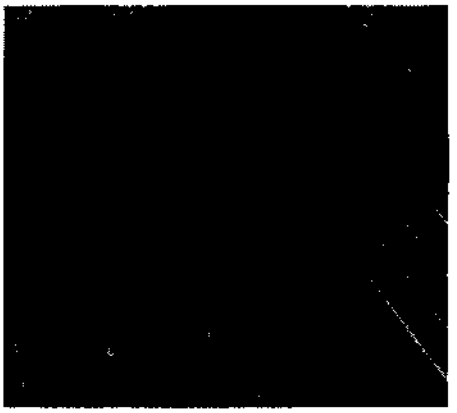

Figure 3: Total dismemberment of WTC 7's steel structure.

## Did the Dog Eat Their Homework? NIST Withheld Crucial Evidence

Had officials taken *all* the relevant evidence into account and provided a superficially coherent explanation, it would at least make sense to *entertain* the idea that, 1) fire might have acted in ways that it had never acted before, 2) modern structural steel might have acted in ways that it had never acted before, and 3) that this all just happened to occur on a day when terrorists did something they had never done before. Yet, officials have *not* taken all the relevant evidence into account and they have *not* provided even a superficially coherent explanation.

### • *"A High Temperature Corrosion Attack" and Molten Iron/Steel: Undeniable Evidence of Thermitic Incendiaries*

Prior to the NIST investigation, FEMA, the Federal Emergency Management Agency, had conducted a preliminary, cursory, underfunded investigation and produced a Building Performance Assessment Report. In Appendix C of that report, FEMA described steel samples from Building 7 that had undergone a "high temperature corrosion attack" that had turned a heavy steel flange "into Swiss cheese." They found "evidence of a severe high temperature corrosion attack on the steel, including rapid oxidation and sulfidation with subsequent intergranular melting...."

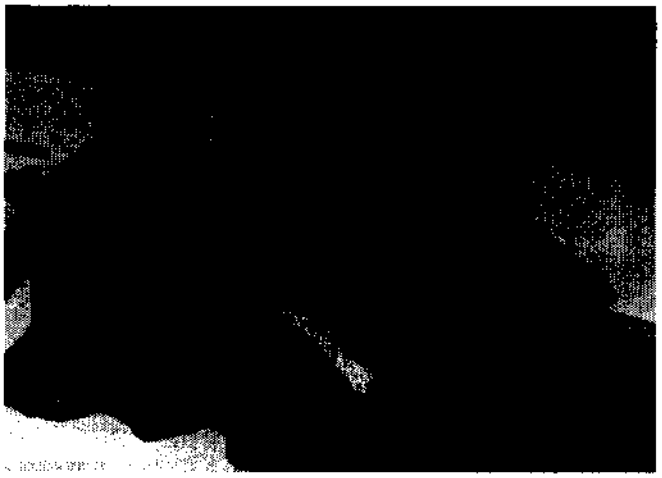

Figure 4: Office fires don't do this to steel.

FEMA's metallographic analysis showed that the steel had not only melted but some of it had even "evaporated". "A liquid eutectic mixture containing primarily iron, oxygen, and sulfur formed during this hot corrosion attack on the steel."... "No clear explanation for the source of the sulfur has been identified." The *New York Times* called this "perhaps the deepest mystery uncovered in the investigation." What did NIST say about this mystery described by FEMA? They did not mention it.

Neither jet fuel nor office fires can reach anywhere close to steel's melting point, much less its boiling point, even if those critical temperatures had been lowered by the presence of free sulfur. So what could have caused this "high temperature corrosion attack"?

*Thermite* is a mixture of powdered iron oxide and elemental aluminum which, when ignited, reacts violently at 4000-4500° F. – well above iron's melting point of 2800° F, producing aluminum oxide and molten iron in a very dangerous, volcanic eruption-like display. When free sulfur is added to the mixture, the iron melts at a lower temperature. Thermite with sulfur added is called *thermate*. Structural steel in contact with ignited thermate also melts at a lower temperature. Contrary to what NIST and others have claimed, the sulfur could not have come from gypsum wallboard in which it is an inert, chemically "locked" ingredient. (FEMA metallurgists would have proposed that explanation themselves if it were within the realm of possibility.)

Still, additional evidence of molten iron and/or steel abounds – for all three high-rises. Photos and numerous credible witnesses (including first responders and structural engineers) confirm the existence of several tons of molten metal under the debris pile – described by some fire fighters as "flowing like lava." Photos clearly reveal molten

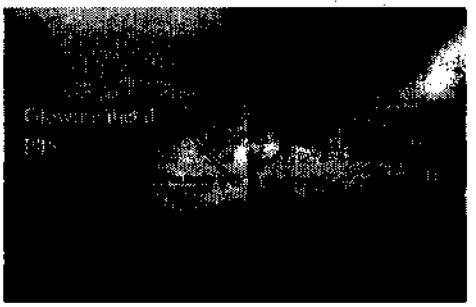

Figure 5: Office fires are not hot enough to create the molten metal seen by dozens of witnesses.

metal dripping out of the material held in the jaws of "crabclaw" excavators.

Video taken of the South Tower shortly before it came down shows a spout of molten metal spewing from near the impact hole, brightly glowing orange-yellow in daylight, unlike molten aluminum, which appears silvery under these conditions. It could only be molten iron or steel.

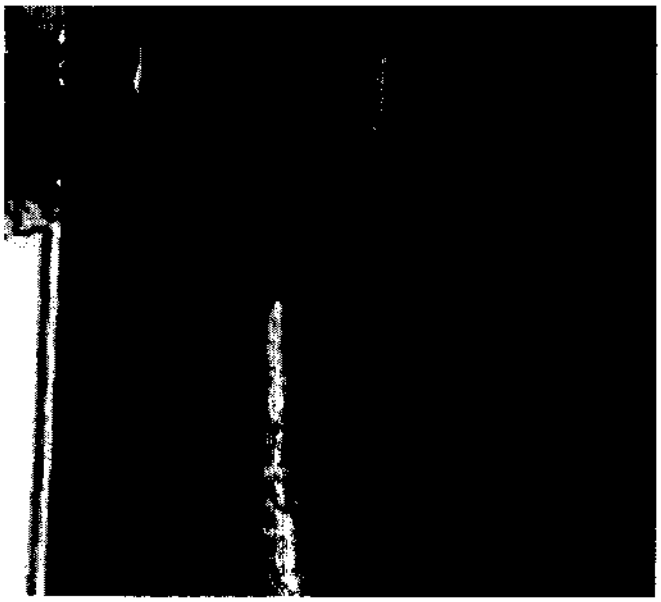

Figure 6: Jet fuel and office fires can't create molten metal

John Gross, lead engineer for NIST, publicly denied the existence of molten metal despite the abundant evidence. Shyam Sunder of NIST later acknowledged it but could not offer a rational explanation for it. NIST's afterthought Answers to Frequently Asked Questions (FAQ) webpage attributes the spout's color to mixing of office contents with the aluminum – a hypothetical phenomenon that physicist Steven Jones and independently a NASA engineer have been unable to reproduce in two laboratory experiments. Given the stakes, one might expect NIST to have used some of the 20 million dollars allocated to the WTC study to show us – not just speculate – that this miraculous mixing of light, fluffy office materials with heavier aluminum makes a poured stream of impure aluminum appear, in bright sunlight, like the orange molten metal seen in the South Tower videos.

### • *Hot Spots with Extreme Temperatures Measured by USGS/NASA*

USGS used NASA thermal imaging of the surface of the WTC rubble pile to document hot spots with extreme temperatures of almost 1,400°F. These temperatures, too, are hotter than most office fires produce. And there were no fires on the surface of the WTC 7 pile following the collapses.

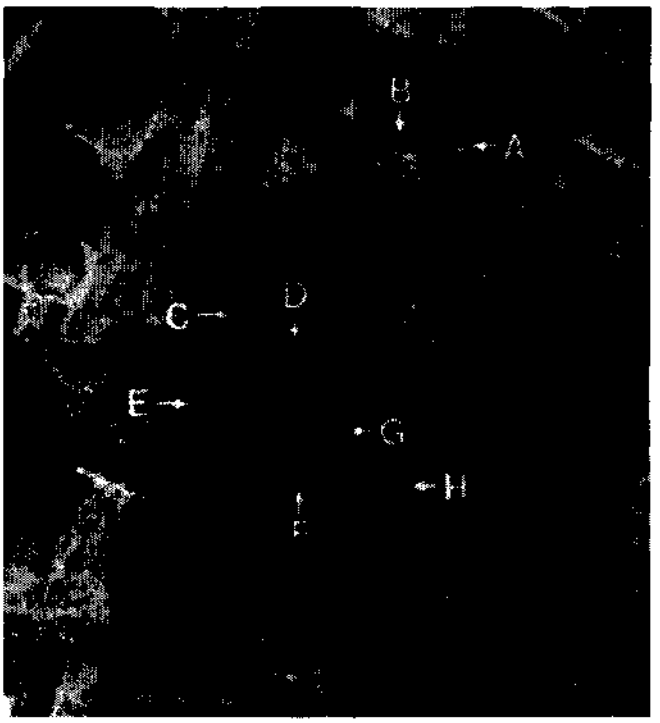


Figure 7: Impossible temperatures on the surface of Ground Zero a week after the collapses.

The detected surface temperatures indicate much higher temperatures deep in the pile, which persisted for several weeks despite the

continuous spraying of millions of gallons of water onto Ground Zero – so much water that one worker described the result as "a giant lake." Thermite contains its own source of oxygen and burns just as well under water.

### • *Molten Iron Droplets in the WTC Dust*

Chemical and micrographic analysis of the dust that blanketed Lower Manhattan after the destruction of each of the Twin Towers revealed the presence of iron-rich "microspheres." These microspheres were found in separately collected samples of the dust both near and far from Ground Zero, some of it collected before cleanup operations had begun. Their shape indicates that they were previously molten fragments that were pulled into spherical form by surface tension into droplets, which solidified before hitting the ground. They are direct evidence that temperatures exceeding the melting point of iron were present during the buildings' destruction. These microspheres could not have been produced by friction or any other known process during the Towers' collapses. Furthermore, they lack the chromium present in structural steel and contain manganese, an ingredient of potassium permanganate, a common thermite additive.

Figure 9: Billions of previously molten iron spheres found in all WTC dust samples.

### • *Aluminothermic Nanocomposites – Unignited Nanothermite in the WTC Dust*

An even more definitive discovery arose during a scientific examination of the dust: red-gray chips. An international team of chemists, physicists, and others confirmed that the chemical makeup of the red layer of these chips, their granular structure, and thermal behavior, were all consistent with those of advanced thermitic explosives.

Figure 8: Hundreds of red/gray chips of "unignited nanothermite" in every WTC dust sample.

Particle sizes of less than a tenth of a micron in the red layer classify this material as nanothermite. The significance of the extremely small particle sizes is that the surface area is much greater for a given volume of the components, so chemical reactions are greatly accelerated.

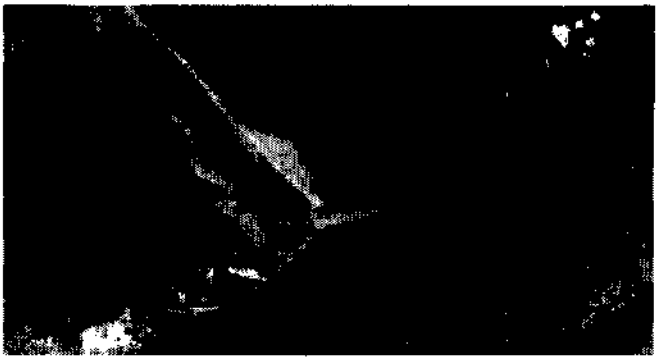

Figure 10: Nanothermite particle sizes are 1,000 times smaller than a human hair. This material is not made in a cave in Afghanistan.

The team published its findings in The Open Chemical Physics Journal in April 2009. Members of the team had earlier asked that NIST test the dust for evidence of explosives. NIST repeatedly refused to do so, even though such testing is

called for by NFPA 921, the National Fire Protection Association guideline for fire and explosion investigations throughout the United States.

NIST did not see fit to even discuss the issue of thermite or explosives in its formal reports. In its FAQ, referring narrowly to tests for ordinary thermite and thermate, they explained that "such tests would not necessarily have been conclusive" because "The metal compounds also would have been present in the construction materials making up the WTC towers..." This is technically correct, and NFPA 921 does emphasize the need to make inferences cautiously: "Presence of remains from the oxidizers does not in itself constitute an intentionally set fire." (section 22.2.4, 2008 edition). However, NFPA 921 does not provide any justification for *not performing* tests, especially when there is evidence of "high temperature accelerants (HTAs)," such as "melted steel" (22.4.1) The guidelines refer to thermite specifically: "Thermite mixtures also produce exceedingly hot fires. Such accelerants generally leave residues that may be visually or chemically identifiable."

Moreover, the team of scientists who *did* look at the dust found an exotic, highly engineered form of thermite, known as nanothermite, or superthermite. It doesn't just melt steel; it *explodes*. It can be chemically tuned to do so with less noise than conventional explosives. And it cannot be confused – even by overworked government engineers – with structural steel, rust, primer paint, aluminum cladding, or other "construction materials."

It contains ultra fine grain particles of aluminum and iron oxide, 1,000 times smaller than a human hair, "intimately intermixed" and embedded in a matrix of organic material. When it is heated slowly to about 430° C it "goes off" thermally, producing molten iron in spheroids reminiscent of those found in the dust. Clearly the reaction, triggered at only 430° C, releases enough energy to raise the temperature beyond the melting point of iron (1538°C.).

## Looks Who's Here

Nanothermite could not have been made in a cave in Afghanistan. It was developed in the 1990's in US national laboratories, and is produced by only a few defense contractors. Some of those same contractors contributed personnel to the NIST investigation of the destruction of the World Trade Center. Very highly placed personnel, in fact, in positions of leadership at NIST:

Arden Bement, the metallurgist and expert on fuels and materials who was nominated as director of NIST by President George W. Bush in October 2001, was former deputy secretary of defense, former director of DARPA's office of materials science, and former executive at TRW.

Of course, DOD and DARPA are both leaders in the production and use of nanothermites.... And military and aerospace contractor TRW has had a long collaboration with NASA laboratories in the development of energetic materials that are components of advanced propellants, like nano-gelled explosive materials.... TRW Aeronautics also made fireproof composites and high performance elastomer formulations, and worked with NASA to make energetic aerogels...

Forman Williams, the lead engineer on NIST's advisory committee, and the most prominent

engineering expert for *Popular Mechanics*, is an expert on the deflagration of energetic materials and the "ignition of porous energetic materials...." Nanothermites are porous energetic materials. Additionally, Williams' research partner, Stephen Margolis, has presented at conferences where nano-energetics are the focus.... Some of Williams' other colleagues at the University of California San Diego, like David J. Benson, are also experts on nanothermite materials. (Kevin Ryan, "The Top Ten Connections Between NIST and Nano Thermites", July 2, 2008, Journal of 9/11 Studies.)

How did people with such expertise miss all the features of controlled demolition, and the nanothermite in the dust? For them to avoid even discussing the possibility in their 11,500 pages of "final" reports, and to wave it away with a few sentences on their website, is an outrage to science, at a minimum.

## What About the Twin Towers?

The collapses of the WTC Twin Towers represent the worst structural failures in modern history.

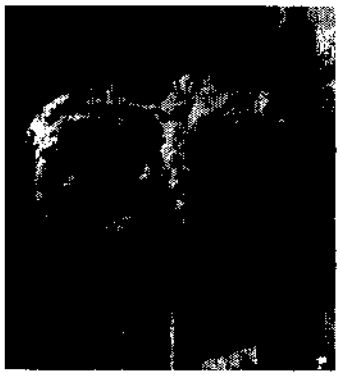

Figure 11: South Tower - A very explosive event.

The official story suggests that the jetliner impacts and resulting fires weakened the structure, resulting in a gravitational collapse. The evidence, most of which was omitted from the NIST report, supports a different conclusion – one that points squarely to a unique type of controlled demolition. This evidence includes:

1. Rapid onset of destruction
2. Sounds of explosions and flashes of light heard and seen by over a hundred first responders before "collapse"
3. Continuous acceleration of the building mass straight down through the path of what *was* greatest resistance
4. Multi-ton steel sections ejected laterally 600 feet at 50 mph
5. Mid-air pulverization of 90,000 tons of concrete
6. Massive volume of expanding pyroclastic-like clouds
7. 1,200-foot diameter of improbably equal debris distribution
8. Isolated explosive ejections 20-60 stories below demolition waves
9. Total building destruction: dismemberment of steel frame
10. No stack of floors found at the base of either tower

If powerful insiders had the foreknowledge and technology to rig Building 7 long in advance of the jetliner impacts, the same is true for the Twin Towers. Every American must face his own conscience squarely when confronted with the gruesome evidence of the destruction of these high-rises on 9/11 – especially considering the resulting death of over a million people in the wars that followed, and the loss of many of our precious freedoms through quickly passed legislation.

ARCHITECTS & ENGINEERS for 9/11 TRUTH

# Focus On: World Trade Center 7

**April 2014**

## Freefall and Building 7 on 9/11

*by David Chandler*

Galileo was the first to describe the amazing fact that, apart from air resistance, all objects fall at the same "rate." If you have not experienced this fact directly, try dropping a large rock and a pebble side by side. The rate we are referring to is not a "speed," because for a falling object the speed is constantly changing. The rate we are talking about is actually the "rate of increase of speed," how quickly the speed builds up, called acceleration. The acceleration achieved by all falling bodies, apart from air resistance, is called the "acceleration of gravity."

Gravity causes freely falling objects to increase their speed by about 32 ft/s per second. (The awkward unit, feet per second per second is commonly abbreviated ft/s2.) When an object is dropped, the speed is initially zero, but it immediately starts speeding up. After 1 second its speed will be 32 ft/s. After 2 seconds its speed will be 64 ft/s. Etc. 32 ft/s2 is an approximation. The "acceleration of gravity" actually varies slightly from place to place. In New York City it is 32.159 ft/s2.

Isaac Newton showed that the acceleration of an object is governed by its mass and the net force acting on it. (If several forces are acting at once they are combined to give a "net" force.) If the downward acceleration of a falling object equals the acceleration of gravity, then the net force is the gravitational force alone; any other forces must add up to zero.

What if a heavy object falls through other objects, breaking them as it goes? Newton's third law says that when objects interact, they always exert equal and opposite forces on each other. Therefore, while an object is falling, if it exerts any force on objects in its path, those objects must push back, slowing the fall. If an object is observed to be in freefall, we can conclude that nothing in the path exerts a force to slow it down, and by Newton's third law, the falling object cannot be pushing on anything else either.

Figure 1: Freefall of WTC 7

When the top section of a building collapses one would expect the falling section to crash into the lower section and exert a large force on it, like dropping an anvil on your toe. A typical controlled demolition exploits this fact: the crushing force of the falling section of the building contributes to

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the demolition, and reduces the amount of explosives that are needed. However, amazingly, this is not what happened when Building 7 "collapsed" on 9/11.

We know that the falling section of Building 7 did not crush the lower section of the building because the top section of Building 7 fell at freefall. It didn't just fall at something close to freefall. It fell for about 2.5 seconds at a rate that was *indistinguishable* from freefall. If the falling section of the building had crushed the lower section, the lower section would have pushed back with an equal but opposite force. But that would have slowed the fall. Since the fall was not slowed in the slightest, we can conclude that the force of interaction was zero... in both directions. How can this be?

There were explosions in Building 7 heard by many witnesses throughout the day. One such explosion is recorded in a video clip where several fire fighters are gathered around a pay phone calling home to assure their families they are alright. Suddenly they are startled by a very loud, unmistakable explosion. This is one of the Building 7 explosions that occurred long before it fell.

Shortly before the ultimate collapse of the building the east penthouse and the columns beneath it suddenly gave way. NIST (the government agency assigned to investigate the building collapses) attributes the collapse of the east penthouse to the failure of a single column, in a complex scenario involving thermal expansion of beams supporting the column. But it is much more likely that at least two and possibly three supporting columns were "taken out" simultaneously. Three columns supported the east penthouse. One of our German colleagues has pointed to evidence that the east penthouse fell through the interior of the building at close to freefall, evidenced by a ripple of reflections in the windows as it fell. Yet the exterior of the building retained its integrity.

NIST claims that the collapse of their one key column led to a progressive collapse of the entire interior of the building leaving only a hollow shell. The collapse of the building, seen in numerous videos, is described by NIST as the collapse of the "facade," the hollow shell. They have no evidence for this scenario, however, and a great deal of evidence contradicts it. After the collapse of the east penthouse there is no visible distortion of the walls and only a few windows are broken at this time. Had the failure of interior columns propagated throughout the interior of the building, as asserted by NIST, it would surely have propagated to the much closer exterior walls and distorted or collapsed them. (Major crumpling of the exterior walls, by the way, is exactly what is shown in the animations produced by NIST's computer simulation of the collapse.) But the actual videos of the building show that the exterior remained rigid during this early period. At the onset of collapse you can see in the videos that the building suddenly goes limp, like a dying person giving up the ghost. The limpness of the freefalling structure highlights by contrast the earlier rigidity.

Furthermore, there are huge pyroclastic flows of dust, resembling a volcanic eruption, that poured into the streets following the final collapse of the building. If what we saw was only the collapse of the facade, why was the pyroclastic flow not triggered earlier when NIST claims the collapse of the much more voluminous interior occurred? And why did the west penthouse remain to fall with the visible exterior of the building? Its

supporting structure clearly remained to the very end and was "taken out" along with the rest of the building support all at once. NIST is scrambling to find a plausible scenario that will allow it to escape the consequences of what is plainly visible. (If you have not seen the collapse of Building 7, find it on YouTube and watch for yourself. For most people simply watching it collapse is all it takes. Most people are not stupid. Most people can recognize the difference between a demolition and a natural building collapse with nothing more being said. If you have never seen the collapse of Building 7 you might also stop and ask yourself why the mainstream media did not repeatedly show you this most bizarre event as it did the Twin Towers.)

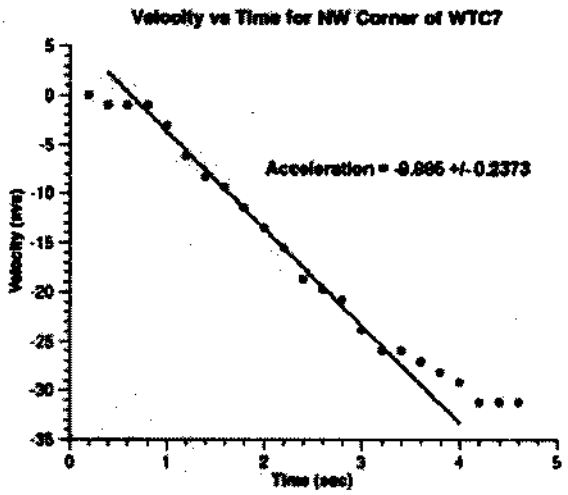


Figure 2: Velocity vs. Time for NW Corner of WTC 7

After the east penthouse collapsed, several seconds elapsed, then the west penthouse began to collapse, at nearly the same time the roofline of the building developed a kink near the center, then all support across the entire width of the building was suddenly removed, a vertical swath of windows under the west penthouse were simultaneously blown out, the building suddenly went limp, and (within a fraction of a second) it transitioned from full support to freefall. I am not using the term "freefall" loosely here. I used a video analysis tool to carefully measure the velocity profile of the falling building using CBS video footage from a fixed camera aimed almost squarely at the north wall. A video detailing this measurement is available at YouTube/user/ae911truth. I calibrated my measurements with the heights of two points in the building provided in the NIST Building 7 report released in August 2008, so I know the picture scale is good. My measurements indicate that with sudden onset the building underwent approximately 2.5 seconds of literal freefall. This is equivalent to approximately 8 stories of fall in which the falling section of the building encountered zero resistance. For an additional 8 stories it encountered minimal resistance, during which it continued to accelerate, but at a rate less than freefall. Only beyond those 16 stories of drop did the falling section of the building interact significantly with the underlying structure and decelerate.

Freefall is an embarrassment to the official story, because freefall is impossible for a naturally collapsing building. In a natural collapse there would be an interaction between the falling and the stationary sections of the building. This interaction would cause crushing of both sections and slowing of the falling section. I have done measurements on several known demolitions, using similar software tools, and found that they typically fall with accelerations considerably less than freefall. Building 7 was not only demolished, it was demolished with tremendous overkill. Freefall was so embarrassing to NIST that in the August 2008 draft release for public comment of their final report, the fact of freefall was denied and crudely covered up with the assertion that the collapse took 40% longer than "freefall time."

They asserted that the actual collapse, down to the level of the 29th floor, took 5.4 seconds whereas freefall would have taken only 3.9 seconds. They arrived at their figures with only two data points: the time when the roofline reached the level of the 29th floor and an artificially early start time several seconds prior to the beginning of the obvious, sudden onset of freefall. They started their clock at a time between the collapses of the east and west penthouses when the building was not moving. They claimed they saw a change in a "single pixel" triggering what they asserted was the onset of collapse, but anyone who has worked with the actual videos will recognize that the edge artifacts in the image of the building make this an unrealistic standard. Furthermore, even if there was a tiny motion of the building at that point, it continued to stand essentially motionless for several more seconds before the dramatic onset of freefall collapse. The fact of a cover up in NIST's measurement is underlined in that the formula they point to as the basis for their calculation of "freefall time" is valid only under conditions of constant acceleration. They applied that equation to a situation that was far from uniform acceleration. Instead, the building remained essentially at rest for several seconds, then plunged into freefall, then slowed to a lesser acceleration. Their analysis demonstrates either gross incompetence or a crude attempt at a cover up. The scientists at NIST are clearly not incompetent, so the only reasonable conclusion is to interpret this as part of a cover up. (It is important to stand back occasionally and recognize the context of these events. This was not just a cover-up of an embarrassing fact. It was a cover-up of facts in the murder of nearly 3000 people and part of a justification for a war in which well over a million people have since been killed.)

I had an opportunity to confront NIST about the easily demonstrated fact of freefall at the technical briefing on August 26, 2008. I and several other scientists and engineers also filed official "requests for correction" in the days that followed. When they released their final report in November 2008, much to the surprise of the 9/11 Truth community, they had revised their measurements of the collapse of the building, including an admission of 2.25 seconds of absolute freefall. However, they couched the period of freefall in a framework of a supposed "three phase collapse sequence" that still occupies exactly 5.4 seconds. The recurrence of 5.4 seconds, even in a completely revised analysis, is very puzzling until you realize its context. NIST lead investigator Shyam Sunder told the audience in the August 26, 2008 Technical Briefing that their computerized collapse model had predicted the collapse down to the 29th floor level would take 5.4 seconds, well beyond the 3.9 seconds required for freefall. From the events at the Technical Briefing it appears that a team headed by structural engineer John Gross dutifully fabricated a 5.4 second observation to exactly match the prediction. Anyone with any experience in laboratory measurement would have expected some amount of uncertainty between the prediction and the measurement. They would have been doing extremely well to come up with a computer model that would predict the collapse time within 10%. But no...their measurement exactly matched the prediction to the tenth of a second. Keep in mind that their computer model was constructed in the absence of the actual steel, which had long since been hauled away and destroyed. According to NIST's records, none of the steel from Building 7 remains. (Pause and ponder that fact for a moment. Anyone who has

watched CSI knows the importance of preserving the physical evidence in a crime scene.

Destroying a crime scene is in itself a crime, yet that is exactly what happened in the aftermath of 9/11, and it happened over the loud protests of the firefighters and others who had a stake in really finding out the truth.) Back to our story. NIST's computer model predicted 5.4 seconds for the building to collapse down to the level of the 29th floor. John Gross and his team found the time the roofline reached the 29th floor, then picked a start time exactly 5.4 seconds earlier to give a measurement that matched the model to the nearest tenth of a second. They took their start time several seconds prior to the actual start of freefall when nothing was happening. The building was just sitting there, with the clock running, for several seconds. Then it dropped, with sudden onset, and continued for 2.5 seconds of absolute freefall.

So, NIST now acknowledges that freefall did occur. How do they explain that? They don't. They simply state, without elaboration, that their three-phase collapse analysis is consistent with their fire induced collapse hypothesis. The only thing about the three-phase analysis that is consistent with their collapse hypothesis is the 5.4 second total duration, measuring from their artificially chosen starting time. In other words, they make no attempt to explain the 2.25 second period of freefall. They just walked away from it without further comment.

The fact remains that freefall is not consistent with any natural scenario involving weakening, buckling, or crushing because in any such a scenario there would be large forces of interaction with the underlying structure that would have slowed the fall. Given that even known controlled demolitions do not remove sufficient structure to allow for actual freefall, how could a natural fire-induced process be more destructive? Add to that the synchronicity of the removal of support across the whole width of the building, evidenced by the levelness of the roofline as it came down, and the suddenness of onset of collapse, and the immediate transition from full support to total freefall. Natural collapse resulting in freefall is simply not plausible. It did not happen. It could not happen. Yet freefall did in fact happen. This means it was not a natural collapse. Forces other than the falling upper section of the building suddenly destroyed and removed the supporting columns for at least eight stories across the entire length and width of the building.

The freefall of Building 7 is one of the clearest of many "smoking guns" that proves explosives were planted in the World Trade Center buildings prior to September 11, 2001.

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ARCHITECTS & ENGINEERS for 9/11 TRUTH

Focus On:
World Trade Center 7

November 2012

# How Did They Know? Examining the Foreknowledge of Building 7's Destruction

*by Dennis McMahon, J.D., LL.M.*

WTC Building 7, also known as the Salomon Brothers Building or WTC 7, was a 47-story skyscraper that was part of the World Trade Center complex. Built in 1984, Building 7 would have been the tallest high-rise in thirty-three of our United States. Building 7 housed several intelligence and law enforcement agencies, and the NYC Office of Emergency Management's Emergency Operations Center, more commonly known as "Giuliani's Bunker," along with several major financial institutions.

Building 7, which was 100 yards from the Twin Towers, was not hit by an airplane on September 11, 2001, and suffered only minimal damage from debris falling from the North Tower. Several fires began burning on a few floors, and the entire building completely collapsed – almost into its own footprint – at 5:20 p.m. Numerous eyewitnesses, including members of the Fire Department of New York (FDNY) and other first responders, and multiple news sources, made statements that indicate that there was foreknowledge that WTC 7 was going to come down, despite the fact that no skyscraper in history had ever completely collapsed due to fire. (Much of this evidence of foreknowledge is detailed on the website of the Remember Building 7 campaign[1] and other related sites.)

Where foreknowledge of an extremely unusual event is demonstrated, the possibility must be considered that the foreknowledge derived directly or indirectly from those who had inside information about, and/or control over, the event itself. Thus, if foreknowledge of the collapse of Building 7 can be shown, this would be a strong indication that Building 7 was subjected to controlled demolition, and that advance warning of Building 7's demise derived ultimately from those who intended to bring the building down. Thus, foreknowledge of the collapse of Building 7 is not only consistent with, but supportive of, the controlled demolition hypothesis.

## Certainty of impending collapse

To worry that a damaged building might collapse in some fashion is one thing. But to be certain that it will collapse is another. A detailed study of the FDNY accounts by 9/11 researcher Graeme MacQueen shows that more than half of those who received warnings of WTC 7's collapse (where a degree of certainty can be determined from the reports) were certain or were told with

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certainty that Building 7 was coming down. (The figures calculate to 31 out of 58. See MacQueen's report "Waiting for Seven..." at page 4.)[2]

## Early FDNY announcements of collapse

If someone were observing the fires in WTC 7 and able to determine, in the last few moments of the building's existence, that a peculiar set of circumstances was beginning to threaten the building, that would be one thing. But to receive warnings of the building's collapse well before this set of circumstances arose raises suspicion. Yet, a detailed study of the FDNY reports shows that of the thirty-three cases where the time of warning can be determined, in ten cases warnings were received two or more hours in advance, and in six cases warnings were apparently received four or more hours in advance. (See MacQueen's "Waiting for Seven..." at page 4.)[3] In other words, the warnings came long before the unique set of circumstances had allegedly come together to cause the building's collapse.

## Precise warnings of collapse

If the collapse warnings were derived from vague worries and concerns, as claimed by the National Institute of Standards and Technology (NIST), the warnings would not have been precise. A complete collapse, such as happened to WTC 1, WTC 2, and WTC 7 on 9/11, was unknown – unless the building was being brought down by controlled demolition. That is why FDNY member James McGlynn could say on 9/11, in reference to one of the Towers, "Any time I've heard of a collapse, it was never an entire building like this turned out to be." (See MacQueen's "Waiting for Seven," at page 21.)[4] Nevertheless, somehow, many people knew in advance that WTC 7 would suffer an unprecedented collapse. Which begs the question, "How did they know?" Consider the following exchange from the FDNY oral histories:

> *Q. "Were you there when building 7 came down in the afternoon?"*
>
> *A: "Yes"*
>
> *Q. "You were still there?"*
>
> *A. "Yes, so basically they measured out how far the building was going to come, so we knew exactly where we could stand."*
>
> *Q. "So they just put you in a safe area, safe enough for when that building came down?"*
>
> *A. "Five blocks. Five blocks away. We still could see. Exactly right on point, the cloud stopped right there."(See MacQueen's "Waiting for Seven..." at page 8.)*[5]

It is quite remarkable that a debris cloud estimate could be so precise for a collapse that was supposedly caused by unforeseen and unplanned events. Had Building 7 "tipped over," which would have been more realistic, given the structural damage that was supposed to be the reason for its collapse, the building could actually have ended up crushing several other tall buildings, creating a destruction zone much farther away from the building.

## Building 7's collapse report in advance by CNN and BBC

In this BBC video,[6] correspondent Jane Standley reports that Building 7 has collapsed; meanwhile (at the 1:17 mark), a fully intact Building 7 can actually be seen — still standing — behind her. Who fed this information to Standley? Apparently, someone who had inside information about, and/or control over, the event itself, released that information to the media prematurely.

Figure 1: Jane Standley of BBC reports WTC 7's collapse more than 20 minutes prior to it occurring.

In another news clip,[7] while Building 7 is seen standing fully erect and showing no signs of impending trauma, CNN's Aaron Brown gives the following report: "We are getting information now that one of the other buildings, Building 7, in the World Trade Center complex, is on fire and has either collapsed or is collapsing..."

Figure 2: Aaron Brown of CNN reports WTC 7's collapse more than an hour prior to it occurring.

Who is he "getting information" from? Again, it appears to be from someone who had inside information about, and/or control over, the event itself, and who released that information to the media prematurely. Only such an individual could have expected Building 7 to come down.

In sum, both CNN and BBC did not merely report that WTC 7 was damaged or that it might collapse. Instead, they prematurely announced the actual collapse of Building 7. No satisfactory explanation has been given about these premature announcements, which were obviously based on data fed to the announcers, apparently by an unknown person or persons who had inside information about, and/or control over, the event itself, and who bungled matters by releasing that information to the media prematurely.

More evidence of foreknowledge of the collapse of Building 7 is preserved in this video where an eyewitnesses can be heard saying: "Keep your eye on that building. It'll be coming down soon." And "The building is about to blow up. Move it back." And also, "We are walking back. The building is about to blow up."[8]

Figure 3: How did construction workers and police on the scene of WTC 7 that afternoon know that "The building is about to blow up?"

These reports were later corroborated by first responder Indira Singh, who, in a radio interview about Building 7, revealed that the FDNY had stated that "We're going to have to bring it down."

**Countdown...**

The testimony of Kevin McPadden, an emergency medical technician and 9/11 first responder, is even more shocking. In a taped interview, McPadden indicated that there was an actual countdown preceding Building 7's collapse:[9]

> *"The Red Cross rep was like, he goes over and he says [to us], 'You gotta stay behind this line because they're thinking about bringing the building down.'...He goes over and he asks one of the...firefighters what was going on...He came back over with his hand over the radio and [you could hear] what sounded like a countdown. And, at the last few seconds, he took his hand off [the radio] and you heard 'three-two-one,' and he was just saying, 'Just run for your life! Just run for your life!' And then it was like another two, three seconds, you heard explosions. Like, BA-BOOOOOM! And it's like a distinct sound...BA-BOOOOOM! And you felt a rumble in the ground, like, almost like you wanted to grab onto something. That, to me, I knew that was an explosion. There was no doubt in my mind..."*

Figure 4: First responder Kevin McPadden has provided key eyewitness evidence regarding the foreknowledge of WTC 7's destruction.

## NIST's response to WTC 7 foreknowledge

NIST has tried to evade the issue of foreknowledge of WTC 7's collapse in its report on the building's destruction by implying:

(a) that the FDNY, on the scene, saw the damage to the building caused by the collapse of WTC 1 and rationally concluded that WTC 7 might collapse; and

(b) that an engineer, early in the day, saw the damage to the building and concluded it might collapse passing on this assessment to others (as per NIST Lead Investigator Shyam Sunder, in a discussion with Graeme MacQueen on CKNX Radio, Wingham, Ontario, on Aug. 25, 2008).

It is true that damage to WTC 7 was directly witnessed by some firefighters and, apparently, led a few (about seven) of them to worry that the building might collapse. However, the great majority (approximately fifty) who were worried about collapse did not base this worry on the physical damage but on what they were told. (See MacQueen's "Waiting for Seven..." at page 5.)[10] Moreover, while an engineer may have communicated his opinion, early in the day, that the building might collapse, neither this communication nor communications from the FDNY is sufficient to explain all of the collective evidence indicating foreknowledge of Building 7's collapse.

Individually, each of the factors discussed above indicates the possibility of foreknowledge of Building 7's collapse: the certainty of Building 7's impending collapse as expressed and memorialized in the FDNY oral histories, the early announcements made by the FDNY, the precise nature of the early announcements, CNN's and the BBC's premature reporting of Building 7's collapse, and the actual countdown to Building 7's demise. Collectively, these factors provide evidence beyond a reasonable doubt that this foreknowledge is most readily explained by the

fact that Building 7 was brought down in an explosive controlled demolition carefully planned months in advance.

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**End Notes**

[1]http://RememberBuilding7.org
[2]http://www.journalof911studies.com/volume/200701/MacQueenWaitingforSeven.pdf
[3] Ibid.
[4] Ibid.
[5] Ibid.
[6] http://youtu.be/6mxERlgYD3s
[7] http://youtu.be/N1LetB0z8_o
[8] http://youtu.be/cU_43SwWD9A
[9] http://youtu.be/b4z-Wrp1pY8
[10]http://www.journalof911studies.com/volume/200701/MacQueenWaitingforSeven.pdf

ARCHITECTS & ENGINEERS for 9/11 TRUTH

Focus On:

# World Trade Center 1 & 2

**April 2010**

## Twin Towers Evidence Blows Away Fire Collapse Theory

The catastrophic destruction of the World Trade Center complex is said by government reports to have resulted from structural failure due mainly to fires initiated by the impacts of the airplanes. A closer look at the evidence reveals a much more disturbing crime.

Apart from the fact that no steel-framed high-rise building has ever collapsed due to fire prior to or since Sept. 11, the *manner* in which the buildings came down is itself a substantial cause for re-investigation. A collapse due to fire would likely proceed gradually with large deformations visible in the building's perimeter, with the building tipping over slowly in the direction of the steadily weakening structural members – to the path of *least* resistance.

Yet the Twin Towers both came down quite suddenly, without warning, and without any "jolts" that would indicate the upper mass impacting the lower mass. The smooth rate of descent was measured at 2/3 of free-fall. In other words, the building was accelerating (traveling faster and faster second by second) straight down through what should have been the path of *greatest* resistance – the 80,000 tons of structural steel below that was at least five times stronger than necessary to resist this load. Physicists and other experts[1] agree that this could have happened only if the underlying supporting structures were removed *ahead* of the falling upper building mass. The National Institute of Standards and Technology (NIST) acknowledges that each building was destroyed in fewer than a dozen

Figure 1: WTC 2 appears more like an explosion than a gravitational collapse.

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seconds, and that they "came down essentially in free-fall".

For the New York City firefighters on the scene, this rapid destruction without any notice was well beyond their prior experience. Sgt. James Canham, in the oral histories of 118 first responders, put it this way: "This changed all the rules. This went from a structure to a wafer in seconds - in seconds. I couldn't believe the speed of that tower coming down. I heard the rumble. I looked up. Debris was already 50 feet from the ground..."

More than a hundred first responders reported experiencing explosions and/or flashes of light[2] as the destruction commenced. Much of this evidence was also captured on video[3] by multiple cameras. EMT Captain Karin Deshore, in a Nov. 7, 2001, *New York Times* interview, described the astonishing events like this: "Somewhere around the middle of the World Trade Center, there was this orange and red flash coming out. Initially it was just one flash. Then this flash just kept popping all the way around the building and that building had started to explode. The popping sound - and with each popping sound it was initially an orange and then a red flash came out of the building and then it would just go all around the building on both sides as far as I could see. These popping sounds and the explosions were getting bigger, going both up and down and then all around the building." There are many similar accounts in this astonishing series of oral recordings[4] effected by NYC Fire Commissioner, Thomas Von Essen, but kept hidden by the city of New York until it was ordered by a federal appeals court to release them to the *New York Times*.

> *"Initially it was just one flash. Then this flash just kept popping all the way around the building and that building had started to explode."*
>
> –Karin Deshore, in a Nov. 7, 2001, New York Times interview

Also captured on video and still photos were isolated explosive jets[5] of material expelled from the sides of the structure 20-60 stories below the so-called "crush zone". These precisely mimic what are known as "squibs" in the controlled demolition industry. Normally such charges are used to cut structural steel members[6] so that the structure is able to fall with little to no resistance.

Figure 2: Multiple isolated ejections up to 60 stories below the "crush zone" can be seen exploding horizontally.

The stack of 110 four-inch thick concrete floors in both towers, each an acre in size, are missing from the rubble pile where photos reveal only a two-story pile of metal debris. A gravitational collapse should have left a pile of floors about 20 stories tall.

As the WTC skyscrapers disintegrated before the eyes of stunned observers, steel framing sections weighing nine tons were hurled up to 600 feet away. This required an explosive force capable of ejecting these perimeter wall units[7] at up to 70 mph as if shot out of a cannon. Some 90,000

tons of concrete and metal decking were pulverized, creating pyroclastic-like flows (hot gases with suspended solids) similar to those observed and filmed during the explosion of the Mt. St. Helens volcano.

When the clouds of dust settled, what was left were remarkably symmetrical 1,400 foot diameter debris fields consisting mainly of completely dismembered structural steel framing. Although the media often repeats that the Twin Towers' concrete floors came down like a series of stacked pancakes, there were in fact no pancaked floors to be found in the photos or videos of the debris piles. "There's no concrete... it was pulverized,"[8] gasped Gov. Pataki at his first visit to the site.

*For further documentation and analysis of the evidence at the destruction of the World Trade Center see the DVD* "9/11: Explosive Evidence – Experts Speak Out" *available at AE911Truth.org.*

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**End Notes**

[1]http://www.journalof911studies.com/volume/2008/TheMissingJolt7.pdf
[2]http://www.journalof911studies.com/articles/Article_5_118Witnesses_WorldTradeCenter.pdf
[3] http://youtu.be/hSApQavkHg8
[4]http://www.journalof911studies.com/articles/Article_5_118Witnesses_WorldTradeCenter.pdf
[5] http://youtu.be/zoAD8HlrLZg
[6] Ibid.
[7] http://youtu.be/djwBCEmHrSE
[8] http://youtu.be/MDuBi8KyOhw

ARCHITECTS & ENGINEERS for 9/11 TRUTH

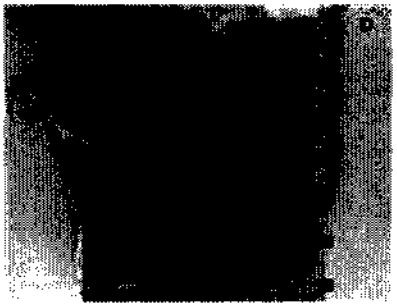
Focus On:

# World Trade Center 1 & 2

November 2010

## Lack of Deceleration of North Tower's Upper Section Proves Use of Explosives

Many people who think they have been keeping up with the revelations of the last several years



about the destruction of the three high-rises in New York City on Sept. 11, 2001, will nonetheless be surprised to discover that the falling upper section of WTC 1 exhibited no measurable deceleration when it impacted the lower section. This is a startling revelation because it adds to the collection of "smoking guns" proving that the "collapse" of that building was not caused by the jetliner impact and ensuing fires.

Although theoretically possible, collapses of heavily constructed buildings like the Twin Towers and WTC 7 had never occurred prior to Sept. 11, 2001, without some form of "assistance." The reason for this is that they are built with significant reserve strength. The construction of each floor is designed to support several times the actual load above it.

The only way a collapse of a structure with significant reserve strength can continue is for the static load to be amplified in what is called dynamic loading. Dynamic loading occurs when the impacting object decelerates. For instance, if during an impact the falling object decelerates at twice the rate of gravity, it will impart a load on the object it strikes that is three times its static load. This occurs due to an additional force with an acceleration value twice that of gravity being added to the static load. This amplified load is represented by the equation $F = mg + m(\text{deceleration})$, where mg is the static load and the m(deceleration) term is the additional load due to dynamic effects. Dynamic loading was postulated in a paper used in the NIST report on the WTC collapses, written by Dr. Zdenek Bazant of Northwestern University. However, Dr. Bazant had not performed any actual measurements to support his theory.

Actual measurements of the descent of WTC 1 were performed independently in 2008 by physics instructor David Chandler of Fresno, California, and Professor Graeme MacQueen of Hamilton, Ontario. Both found no evidence of deceleration at any time during the descent. In fact the upper section of WTC 1 continuously

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accelerated, at approximately 2/3 of g (free-fall) during the first several seconds of the building's "collapse."

The contradiction caused by the lack of deceleration of the upper section of WTC 1 with the dynamic loading event postulated, but never measured, by Dr. Bazant or NIST, is discussed in a published paper entitled "The Missing Jolt," which can be found online at the Journal of 9/11 Studies.[1]

Proof that the necessary deceleration is observable in a collapse in which the momentum and kinetic energy of an upper section break the columns in the lower section is found in the demolition of several buildings in France. In recent years demolition engineers there have devised a system known as the Verinage technique, where they demolish buildings without the use of explosives. This technique uses hydraulic rams to break all of the columns in a couple of stories near the center of the building. The loss of vertical support in these stories then causes the upper section to fall unimpeded through a pre-determined distance before impacting the intact lower structure. Watch this video of one of these demolitions – of the Balzac-Vitry building.[2]

In all known measurements of these "Verinage" demolitions, the descent of the roofline shows definitive proof of deceleration of the upper building sections as they impact the lower structure, as seen in the velocity graph of the Balzac-Vitry building demolition below.

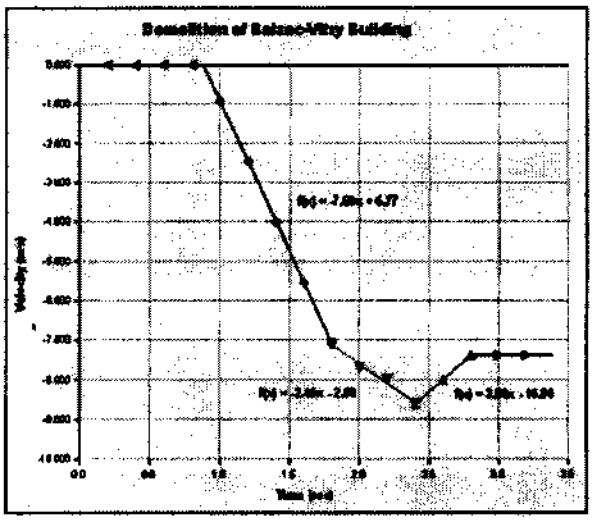

Figure 1: Demolition of Balzac-Vitry Building

Now compare the above velocity graph of the Balzac-Vitry demolition to the velocity graph of the WTC 1 "collapse."

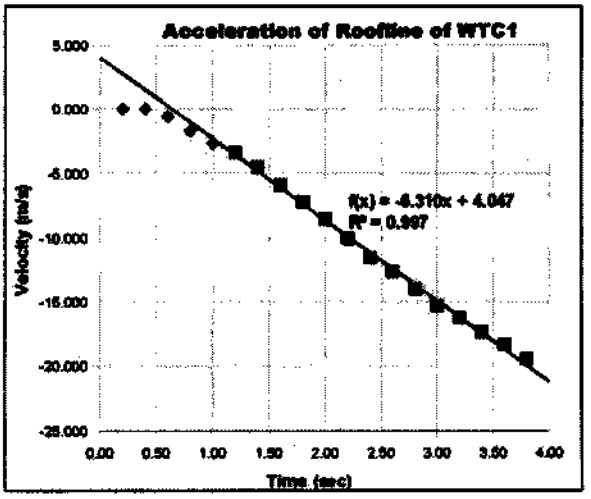


Figure 2: Acceleration of Roofline of WTC 1

The same measurement methodology is used in both cases.

There is obviously no deceleration in the fall of the upper section of WTC 1. A "natural" collapse (without the use of explosives) could not have

occurred without it. Therefore, this verified scientific data proves that explosives must have been employed to remove the structural columns – and thus to bring down the World Trade Center North Tower.

It stands to reason that if the North Tower was brought down surreptitiously with explosives, then the South Tower must have been as well. Its destruction was similarly explosive, rapid, and thorough, though with a few differences in the features of its destruction.

Some excellent video footage shows experiments and provides additional discussion on why the lack of deceleration by WTC 1's upper section could not have been caused by simple overload of columns – even though several may have been "cut" by the jetliner impact and others weakened by the ensuing fires. Professional engineer Jonathan Cole and David Chandler have recently produced several brief but cogent videos on the subject:

*9/11 Experiments: Collapse vs. Demolition ~ Part 1 of 2*[3]

*9/11 Experiments: Collapse vs. Demolition ~ Part 2 of 2*[4]

*9/11 Experiments: Newton vs. NIST*[5]

*What a Gravity-Driven Demolition Looks Like*[6]

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**End Notes**

[1] http://www.journalof911studies.com/volume/2008/TheMissingJolt7.pdf
[2] http://youtu.be/syzKBBB_THE
[3] http://youtu.be/ww8hBFNY8jk
[4] http://youtu.be/dgZLXl3whGA
[5] http://youtu.be/tejFUDlV81w
[6] http://youtu.be/NiHeCjZIkr8

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Focus On:
World Trade Center 1 & 2

June 2014

# What Was the Molten Metal Seen Pouring Out of the South Tower Minutes Before Its Collapse – Steel and Iron, or Aluminum and/or Lead?

*by Simon Faulkner*

A December 2001 paper, "Why Did the World Trade Center Collapse? Science, Engineering, and Speculation,"[1] dismissed early reports about molten steel at the demolished World Trade Center. Dr. Thomas W. Eagar, a professor of materials engineering and engineering systems at the Massachusetts Institute of Technology, and his graduate research student, Christopher Musso, pointed out that the theoretical maximum temperature of a building fire (maximum 1000°C / 1800°F) is not even close to the melting point of steel (approximately 1500°C / 2750°F). And they noted that the observed black smoke emanating from the Twin Towers was consistent with a typical oxygen-starved building fire.

Figure 1: The black smoke at the Twin Towers was indicative of the incomplete combustion usually associated with low-temperature fires. Office fires cannot melt steel, even given optimal conditions.

Eagar and Musso concluded that the actual temperature most likely remained below 650°C/1200°F. In so doing, they dispelled the myth that the jet fuel could have made the fires unusually hot, noting that it was "highly unlikely" that the temperature rose above 800°C/1470°F.

AE911Truth agrees that the jet-fuel-induced fires in the Twin Towers could not have melted steel. But because more recent reports confirm the presence of molten steel[2] and molten iron[3] both during and after the 9/11 event, it must be determined what actually melted those two metals and in so doing demolished two of the world's tallest steel-frame skyscrapers.

## The Official Fire-Based Hypothesis Cannot Account for the Stream of Liquid Metal Seen Pouring Out of the South Tower

The National Institute of Standards and Technology (NIST) did document the flow of molten metal pouring out of the South Tower during the final seven minutes before its collapse, noting the accompanying "unusual

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bright flame" and "plume of white smoke."[4] However, NIST failed to investigate the phenomenon, dismissing it as molten aluminum from the crashed jet, which melts at only 660°C/1220°F.

Figure 2: Yellow-white glowing molten metal is seen pouring from the South Tower just minutes before its collapse. Accompanying white smoke was sometimes visible. NIST did not investigate the phenomenon. Video may be viewed at http://youtu.be/OmuzyWC60eE.

NIST's hypothesis may seem plausible at first. But Dr. Steven Jones demonstrates in his 2006 paper "Why Indeed Did the WTC Buildings Completely Collapse?"[5] that the official government hypothesis is untested and implausible.

Dr. Jones' paper reveals that the initial bright yellow-white glow of the expelled liquid was consistent with a glowing stream of molten iron from "a nearby thermite reaction zone," and the expected white smoke (aluminum oxide off-gassing) supports that conclusion. NIST must rely on its claim of molten aluminum in order to validate its official fire-based explanation, because office fires cannot generate the extreme temperature required to melt steel or iron. The fundamental flaw of the aluminum hypothesis, though, is that the implied temperature of the white glow remains above 1200°C/2200°F, *regardless* of the metal involved. An independent researcher suggested that the molten substance could be lead from storage batteries,[6] but this explanation fails — as do all hypotheses based on alternative metals — because the temperature required for the yellow-white glow of the metal is beyond the capability of the building fire.

Figure 3: A thermite reaction generates yellow-white hot molten iron at well over 2,500°C/4,000°F and white smoke. This type of material can melt and cut steel beams.

Dr. Jones also notes that molten aluminum appears silvery as it melts at 660°C/1220°F, and that it remains silvery when poured in daylight conditions, regardless of the temperature. It is theoretically possible to continue heating liquid aluminum way past its melting point and into the yellow-white

Figure 4: Molten aluminum appears silvery when poured in daylight conditions, even if initially heated to the yellow-white temperature range in the crucible.

temperature range, but the office fire was not a plausible source for such high temperatures, and there was no crucible to contain liquid aluminum for continued heating. Put another way, even if the building fire could have somehow provided the needed temperature for the yellow-white glow, the unrestrained aluminum would have melted and trickled away before it could achieve such a temperature. This problem also rules out other proposed alternative metals — lead, for example — which have similarly low melting points.

Finally, Dr. Jones adds that even if liquid aluminum could have been restrained long enough to make it glow white, it would still have appeared silvery within the first two meters of falling through the air in daylight conditions, due to its high reflectivity and low emissivity.

Thus, the liquid metal seen pouring out of the South Tower could not have been aluminum, since it remains yellow in broad daylight, despite falling several hundred feet through the air.

NIST tries to circumvent this problem with the untested proposition that the observed glow could be due to the mixing of aluminum with combustible organic materials from the building's interior. But Dr. Jones has actually performed the experiments that soundly refute NIST's hypothesis. As he puts it, "This is a key to understanding why the aluminum does not 'glow orange' due to partially-burned organics 'mixed' in (per NIST theory), because they do *not* mix in! My colleague noted that, just like oil and water, organics and molten aluminum do not mix. The hydrocarbons float to the top, and there burn — and embers glow, yes, but just in spots. The organics clearly do *not* impart to the hot liquid aluminum an 'orange glow' when it falls, when you actually do the experiment!"

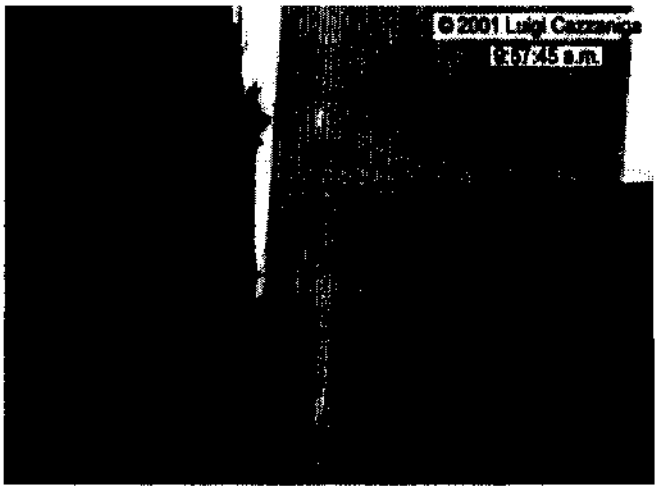


Figure 5: The liquid metal cannot be aluminum, for it remains orange-yellow, despite falling several hundred feet in broad daylight. NIST states that aluminum "can display an orange glow" if blended with organic materials, but Dr. Jones has experimentally invalidated this theory by demonstrating that organics and molten aluminum do not mix.

Dr. Jones *et al* confirmed the finding of molten iron in a 2008 paper, "Extremely high temperatures during the World Trade Center destruction,"[7] which documents their discovery of iron-rich microspheres in WTC dust samples from

two independent sources.

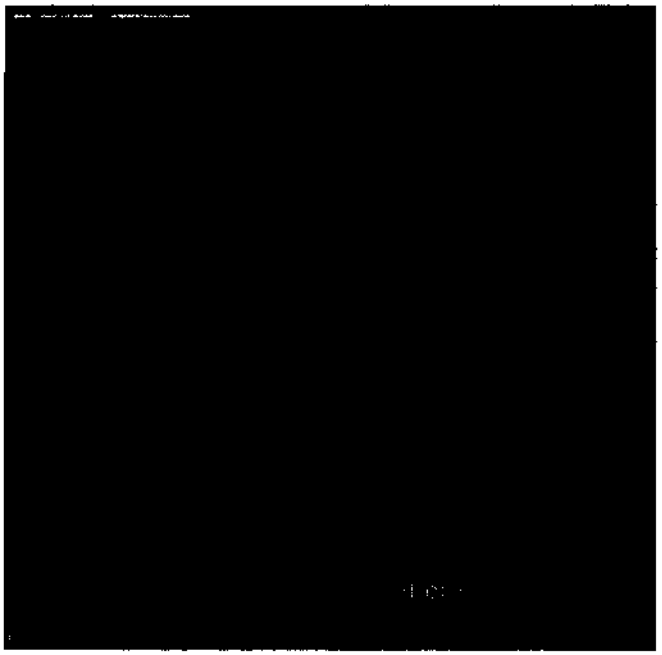

Figure 6: Several reports document the abundant iron-rich spheres in the WTC dust, confirming the formation of molten iron "during the event," according to an independent study of the South Tower dust by RJ Lee Group.

## The Official Fire-Based Hypothesis Cannot Account for the Red-Hot Steel Beams and Pools of Molten Metal Seen During the First Weeks of Clean-up

Numerous professionals have testified that they saw "molten steel" beneath the Ground Zero rubble.[8] But they are not metallurgists, so how did they know enough to have identified it correctly as steel?

NIST dodges the answer to that question by claiming that there was no molten metal to investigate. NIST engineer John Gross, co-project leader of the official investigation, denied the existence of the witness reports.[9]

So we must look to the context, which provides a clear answer: The primary structural components of the WTC Towers were steel columns, steel beams, and steel floor trusses. Thus, steel was the *only* option that the witnesses had when they identified the unmistakable structural steel components coming out *molten* from under the rubble. Specific statements from these witnesses about "molten steel beams" and beams "dripping molten steel" dispel any remaining doubts.[10] The reported pools of molten metal under the rubble must also have contained some of that molten steel, and perhaps molten iron from thermitic cutting charges as well.

Dr. Jones addressed the evidence from yet another angle, pointing out that "we can rule out some metals based on available data."[11] A photograph taken 16 days after the 9/11 event shows an excavator grabbing debris that remains solid even though it is glowing in the salmon-to-yellow hot range.

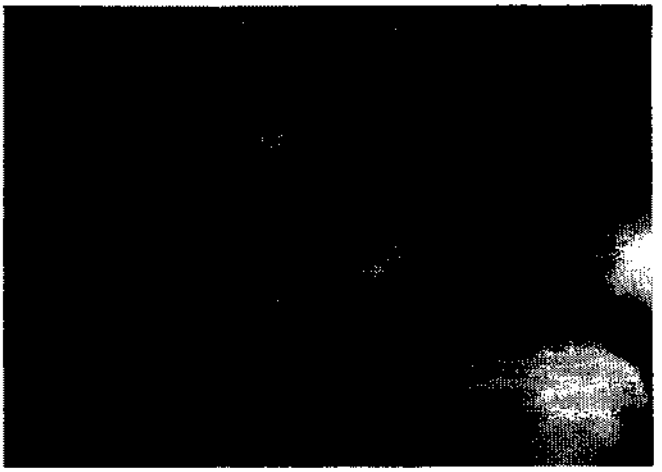

Figure 7: An excavator picks up metal rubble from deep within the pile, and some of it is dripping a yellow-white hot liquid metal at or above 1,200°C/2,200°F. This is approximately double the temperature that can be reasonably expected from an oxygen-starved fire.

Dr. Jones notes that the *solid* metal, glowing in the 845°C/1550°F to 1080°C/1975°F temperature range, could not have been aluminum, lead, or other metals with low melting points, because none of them could have remained solid in this range.

The glowing debris was also dripping liquid metal that appears to have a bright yellow-white glow, which leads to the conclusion that the maximum temperature of the glowing rubble was probably above 1200°C/2200°F — consistent with the yellow-white hot glow of molten steel in a foundry. What makes this so remarkable is that anything over 1000°C/1800°F is above the maximum temperature of a perfectly ventilated fire, and is therefore way beyond the temperature limit of an oxygen-starved fire under the rubble.

The liquid metal could not have been aluminum because it would have had a silvery appearance as it dripped away at its 660°C/1220°F melting point. And we suspect that the powerful floodlights at the demolition site would have made it appear silver-colored, anyway, regardless of the temperature, due to the low emissivity and high reflectivity of aluminum. Dr. Jones adds that the metal in question also needed a "fairly low heat conductivity and a relatively large heat capacity" to remain red hot and even molten for several weeks under the rubble — two traits that identify the metal as steel or iron.

A New York warehouse (see Figure 8) stores similar, but solidified, Ground Zero debris, which supports the conclusion that the excavator at Ground Zero is picking up iron or steel. This solidified lump has the embedded remains of the steel beams seen all around the excavator. Also fused to the warehouse lump are steel reinforcing bars that look like the rods that are seen glowing hot in the claw (see Figure 7). These embedded remains display the characteristic reddish color of rusted iron or steel.

Figure 8: The reddish (rust) color of similar, previously-molten, Ground Zero debris, shown in this warehouse photo, indicates the presence of iron or steel.

The PBS documentary "Relics from the Rubble" shows a similar lump of fused molten concrete and molten steel, which became known as "the meteorite." The leader of the Ground Zero artifact recovery, architect Bart Voorsanger, describes the object, which must have weighed several tons, as "fused element[s] of steel ... molten steel and concrete — and all of these things ... all fused by the heat."[12]

## Thermitic Materials Can Account for the Molten Iron and the Molten Steel

Since building fires cannot account for the reported molten steel beams in the Ground Zero rubble, the official fire-based explanation for the collapses of the WTC buildings must be false.

The official explanation also fails to account for the plenitude of iron-rich spheres, which happen to be yet another signature marker for a thermite reaction. An independent study by the RJ Lee Group actually used the previously liquefied iron-

rich spheres as a signature marker to distinguish the WTC dust from normal building dust, because they were so abundant.[13] Since thermitic materials can actually cut and melt steel beams,[14] evidence of this type of material in the dust provides a plausible explanation for the observed liquid iron and steel: Thermitic cutting charges[15] melt a slit through the steel beams via a directed blast of molten iron,[16] leaving behind the expected residues of molten iron from the charges and molten steel from the beams.

Chemist Kevin Ryan notes[17] that NIST violated the NFPA 921 investigative standard[18] by denying the evidence of molten iron and molten steel, and by refusing to look for pyrotechnic and explosive materials. This is especially suspicious, according to Ryan, because "NIST had considerable connections to nano-thermites, both before and during the WTC investigation."

Although NIST has failed to fulfill its duty, a team of nine scientists has investigated samples of dust from the collapsed Twin Towers and has documented the discovery of microscopic-but-intact remnants of nano-thermite. This type of energetic material can be easily tailored to be either pyrotechnic or explosive.

Chemist Dr. Niels Harrit leads the team of scientists, which includes Dr. Steven Jones and Kevin Ryan. Their investigation resulted in the 2009 peer-reviewed paper, "Active Thermitic Material Discovered in Dust from the 9/11 World Trade Center Catastrophe."[19] Harrit *et al* identify only one of the thermitic materials that must have been used, but they do not attempt to ascertain if the cutting charges were composed of this particular material. Chemical engineer Mark Basile has already independently verified the conclusion of their paper.[20] His study is still being completed and will hopefully be published by the end of 2014.

Figure 9: Dr. Niels Harrit leads an international team of scientists that documents that finding of red-gray nano-thermite chips in four independently collected WTC dust samples. This material ignites and forms the iron-rich spheres that were so abundant in the dust.

Kevin Ryan summarizes the molten metal evidence that we have reviewed here, as well as additional evidence in favor of thermitic materials, in his December 2013 article, "9/11 Truth: How to Debunk WTC Thermite at Ground Zero."[21] Ryan concludes that the evidence is "extensive and compelling," and that the suspected controlled demolition of the WTC buildings via thermitic materials is now "a tested and proven theory." And, as demonstrated above, thermite remains the only viable theory that provides a logical explanation for the liquefied iron and steel found in the World Trade Center rubble.

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**End Notes**

[1]http://www.tms.org/pubs/journals/jom/0112/eagar/eagar-0112.html

[2] http://www.ae911truth.org/news/41-articles/347-high-temperatures-persistent-heat-a-molten-steel-at-wtc-site-challenge-official-story.html
[3] http://www.ae911truth.org/news/41-articles/348-previously-molten-iron-spheres-were-in-wtc-dust-reveal-use-of-thermitic-materials.html
[4]http://www.nist.gov/manuscript-publication-search.cfm?pub_id=101356
[5]http://www.journalof911studies.com/volume/200609/Why_Indeed_Did_the_WTC_Buildings_Completely_Collapse_Jones_Thermite_World_Trade_Center.pdf
[6] http://www.ae911truth.org/en/news-section/41-articles/879-debunking-the-911-truth-debunkers-the-saga-continues.html
[7]http://www.journalof911studies.com/articles/WTCHighTemp2.pdf
[8] http://www.ae911truth.org/news/41-articles/347-high-temperatures-persistent-heat-a-molten-steel-at-wtc-site-challenge-official-story.html
[9] http://youtu.be/fs_ogSbQFbM
[10] http://www.consensus911.org/point-tt-6/
[11]http://www.journalof911studies.com/volume/200609/Why_Indeed_Did_the_WTC_Buildings_Completely_Collapse_Jones_Thermite_World_Trade_Center.pdf
[12]http://youtu.be/bObrsLtJmrY
[13]http://www.rilg.com/litigation-services/case-study/establishing-the-wtc-dust-signature-managing-post-911-environmental-and-damage-assessments/
[14]http://youtu.be/Oamecech9m4
[15]http://www2.ae911truth.org/downloads/PatentUS6183569.pdf
[16]http://youtu.be/Wn-MCCZ3O1M
[17]http://www.journalof911studies.com/volume/2008/Ryan_NIST_and_Nano-1.pdf
[18]http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=921
[19]http://www.ae911truth.org/news/41-articles/351-advanced-pyrotechnic-or-explosive-material-discovered-in-wtc-dust.html
[20]http://youtu.be/JZNQq7XBLwc
[21] http://www.globalresearch.ca/how-to-debunk-wtc-thermite/5360964

ARCHITECTS & ENGINEERS for 9/11 TRUTH

# Focus On: World Trade Center 1 & 2

**August 2010**

## High Temperatures, Persistent Heat & "Molten Steel" at WTC Site Contradict Official Story

Extremely high temperatures were evident before and during the destruction of the World Trade Center Twin Towers and at Ground Zero. Seven minutes before the destruction of the South Tower, a flow of molten metal[1] appeared, accompanied by several smaller flows, as documented by the National Institute of Standards and Technology (NIST).[2] The material's glowing color showed that its temperature was close to "white hot" at the very beginning of the flow and "yellow-orange" further down.[3] Iron-rich spheres in the WTC dust are additional proof of temperatures above the melting point of iron. Pyroclastic-like, rapidly expanding dust clouds after the destruction of the Towers can also be explained only by the expansion of hot gases.[4]

The high-temperature phenomena at Ground Zero are documented by various sources:

Bechtel engineers, responsible for safety at Ground Zero, wrote in the Journal of the American Society of Safety Engineers: "The debris pile at Ground Zero was always tremendously hot. Thermal measurements taken by helicopter each day showed underground temperatures ranging from 400°F to more than 2,800°F."[5]

The fact that high-temperature phenomena were an important issue at Ground Zero is underscored by the large number of thermal images[6] acquired: images by SPOT,[7] MTI, AVIRIS/NASA,[8] "Twin Otter"/U.S. Army, and at least 25 images by EarthData, taken between

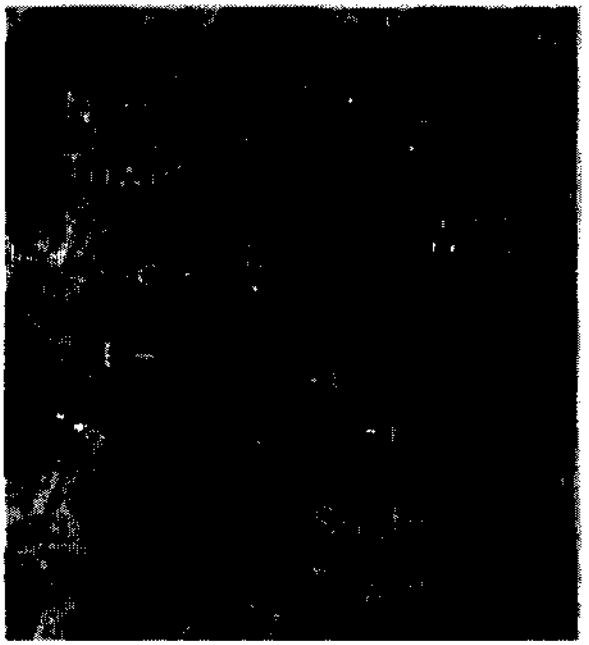

Figure 1: Sept. 16, 2001 thermal images reveal 1,400°F temperatures at the surface of the WTC 1, 2 & 7 debris piles - yet there were no fires at the surface after the collapses. These are the radiant temps from the molten metal deep beneath the surface.

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Sept. 16 and Oct. 25. In addition, temperature measurements by helicopter were taken each day,[9] and the firefighters used onsite sensors too.[10]

Many witnesses, including rescue personnel and firefighters working on the piles, described the phenomenon of "molten steel." Terms used in witness statements[11] are, for example, "molten steel," beams "dripping from molten steel," "molten steel ... like you're in a foundry. Like lava, from a volcano." A photograph taken on September 27 by a Ground Zero worker shows an excavating machine lifting debris from the WTC wreckage dripping yellow/orange molten metal.[12]

WTC clean-up workers and 9/11 artifacts architect Bart Voorsanger, in the PBS video "Relics from the Rubble,"[13] described what must have been several tons of "fused element[s] of steel ... molten steel and concrete and all of these things ...all fused by the heat," weighing several tons each. These foreign objects came to be known as "meteorites."

Figure 2: An excavating machine at Ground Zero lifts debris dripping with molten metal.

The heat at Ground Zero was not only extreme, it was also persistent, as proven not only by witness statements and a photograph by LiRo Group / Engineering of orange-red glowing steel as late as October 21,[14] but also by thermal images taken by NASA[15] and EarthData satellites. The EarthData thermal images also show that the "hot spots" remained at the same locations. The phenomenon did not "move" across the site, like one would expect from fire as it consumes the fuel available in any one location.

University of California professor Abolhassan Astaneh-Asl,[16] the first structural engineer given access to the WTC steel at Fresh Kills Landfill notes, "I saw melting of girders at the World Trade Center." Astaneh also "describes the connections [between supporting columns] as being smoothly warped:[17] 'If you remember the Salvador Dalí paintings with the clocks that are kind of melted – it's kind of like that. That could only happen if you get steel yellow hot or white hot – perhaps around 2,000 degrees.'"

Iron workers at the site pointed out[18] that huge columns that were bent[19] into horseshoe shapes - without the flanges showing any cracks or buckling. They cited, "It takes thousands of degrees to bend steel like this".[20]

FEMA documents in their Appendix C of its May 2002 WTC Building Performance Assessment Team study, for sample 1, "evidence of a severe high temperature corrosion attack on the steel, including oxidation and sulfidation with subsequent intergranular melting." A "sulfur-rich liquid" containing "primarily iron, oxygen, and sulfur" "penetrated" into the steel.[21]

The extremely high temperatures contradict the official story. Office and hydrocarbon fires burning in open air (~500° to 1,500° F) cannot reach

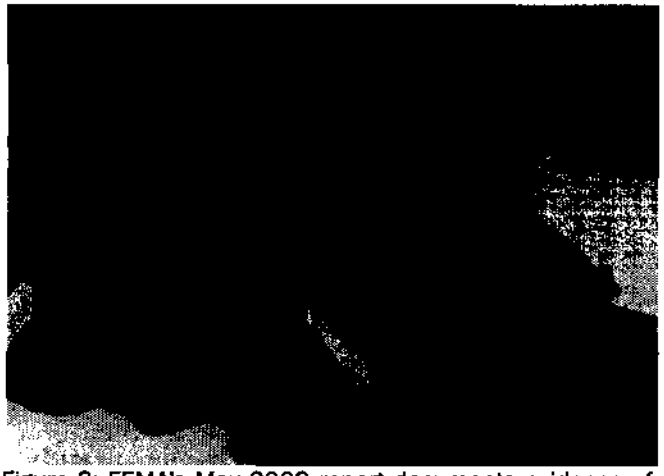

Figure 3: FEMA's May 2002 report documents evidence of a severe high temperature corrosion attack on the steel.

temperatures in the range that iron or structural steel melts (2,700° F). This was even acknowledged by NIST's Co-Project Leader, John Gross, in the same public talk where he stated regarding the phenomena of molten steel, "I know of absolutely nobody, no eyewitnesses that said so, nobody that's produced it."[22] Yet there is abundant proof of the molten metal, which subsequent tests reveal to be iron, in the debris piles.[23] Furthermore, NIST itself performed extensive fire tests to establish the temperatures reached by the WTC office and jet fuel fires.[24] The temperatures established are far below the temperatures required to produce all of the above phenomena – which occurred both before and during the destruction and at Ground Zero.

The steel problem was "solved" by NIST by excluding most of the steel from being systematically examined for failure modes and heat excursions.[25] The steel collected by the Port Authority, which has been stored in Hangar 17 at JFK Airport, was not included in the investigation except for 12 pieces. Of the 236 pieces that NIST possessed, many were excluded based on the circular argument that only columns from impact and fire floors were of interest in the investigation. Thus, NIST avoided having to discuss 51 of its 55 core columns. Sample 1 from FEMA's Appendix C was also excluded.

In addition, NIST developed a new method of "visual examination" that it then substituted in place of the systematically used tool.[26] NIST's "paint cracking" method has the following "advantages": paint cracks can be produced not only by high temperature excursions, but also by "corrosion"/ "environmental degradation" and by plastic deformation; many columns had no paint left for examination, Moreover, by relying on a method that requires microscopic examination, NIST was able to ignore pieces that were obviously heat-affected but had come from non-fire floors. A contractor's report that employed common visual examination was "reviewed": NIST contrasted the contractor's results with their newly developed method and their fire exposure observations, and by employing again a circular argument. NIST's steel "examination" shows that its "working hypothesis" was in fact its premise, and that NIST gone to great lengths to maintain this premise.

Some want to cite "natural thermite reactions" for the high-temperature phenomena: airplane aluminum must have reacted with rust. This possibility can be ruled out based on the findings of a study that was conducted in 2002 at the Colorado School of Mines for the Minerals Management Service. Officially, the study, whose lead author is a close research associate of T. W. Siewert of NIST, is about thermite-sparking in offshore environments. But due to a very odd study design the question about the feasibility of natural thermite reactions in the WTC is answered too. The authors established the ignition temperatures for rust, dehydrated rust and iron-oxide-based thermite reactions. The

necessary temperatures are so high that one can conclude that thermite reactions between airplane aluminum and rust (some rust was on beams according to documents), dehydrated rust (rust dehydrates in fire) or iron oxide (iron oxide was part of the primary paint) were not feasible in the WTC. Also tested was what happens when aluminum impacts rust at very high velocity, so, interestingly, even the possibility that the impacting airplanes caused natural thermite reactions can be ruled out.[27]

The overwhelming evidence of these extremely high temperatures, which normal office fires and jet fuel cannot produce, cries out for a new investigation. The hypothesis of explosive controlled demolition must be examined and, if confirmed, followed wherever it leads, so that Americans can know for sure what was the real cause of the catastrophic loss of life at the WTC on 9/11 and the identities of everyone who was responsible for it.

**End Notes**

[1]http://youtu.be/OmuzyWC60eE
[2]http://www.nist.gov/manuscript-publication-search.cfm?pub_id=101356
[3]http://www.journalof911studies.com/volume/200609/Why_Indeed_Did_the_WTC_Buildings_Completely_Collapse_Jones_Thermite_World_Trade_Center.pdf
[4]http://911research.wtc7.net/wtc/analysis/collapses/dust.html
[5]http://911research.wtc7.net/cache/wtc/analysis/asse_groundzero1.htm
[6]http://911research.wtc7.net/papers/dreger/GroundZeroHeat2008_07_10.pdf
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[8]http://pubs.usgs.gov/of/2001/ofr-01-0429/thermal.r09.html
[9]http://911research.wtc7.net/cache/wtc/analysis/asse_groundzero1.htm
[10]http://mceer.buffalo.edu/publications/wtc/02-SP05-screen.pdf
[11]http://youtu.be/fs_ogSbQFbM
[12]http://www.journalof911studies.com/volume/200609/Why_Indeed_Did_the_WTC_Buildings_Completely_Collapse_Jones_Thermite_World_Trade_Center.pdf
[13]http://youtu.be/bObrsLtlmrY
[14]http://www.ae911truth.org/documents/lironews.pdf
[15]http://pubs.usgs.gov/of/2001/ofr-01-0429/thermal.r09.html
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[17]http://chronicle.com/article/Scholars-Work-to-Rebuild-the/4059
[18]http://www.pbs.org/americarebuilds/artifacts/artifacts_09.html
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[20]http://www2.ae911truth.org/ppt_web/2hour/slideshow.php?i=122&hires=1
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[24]http://www.nist.gov/el/disasterstudies/wtc/
[25]http://www.ae911truth.org/documents/How_NIST_Avoided_a_Real_Analysis_of_the_Physical_Evidence_of_WTC_Steel.pdf
[26]Ibid.
[27]http://www.ae911truth.org/documents/How_NIST_Avoided_a_Real_Analysis_of_the_Physical_Evidence_of_WTC_Steel.pdf

ARCHITECTS & ENGINEERS for 9/11 TRUTH

Focus On:

# World Trade Center 1 & 2

August 2010

## Billions of Previously Molten Iron Spheres in WTC Dust, Reveal Use of Thermitic Materials

The World Trade Center dust is remarkable due not only to its having blanketed Lower Manhattan 4" to 12" thick in many places, but also for the dark secrets that it would reveal.

Iron-rich microspheres were so common in the WTC dust that EPA's WTC panel discussed their use as one of the signature components to distinguish the WTC dust from so-called "background" dust (i.e. common office-building dust).[1]

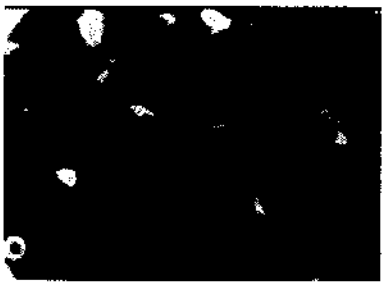
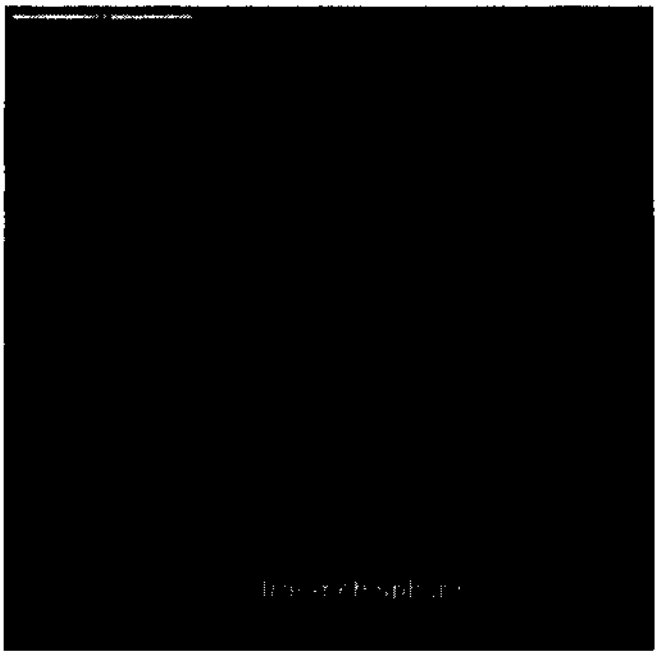


Figure 1: SEM (Scanning Electron Microscope) image of WTC dust shows large quantities of iron-rich microspheres.

RJ Lee Group, evaluating the contamination of the Deutsche Bank building at 130 Liberty Street, also described these iron-rich spheres,[2] and actually used them as one of their signature markers.[3] In other words, dust wasn't regarded as WTC dust unless it contained these spheres. The chemical composition[4] and micro-images of two WTC iron-rich spheres[5] [6] were documented by the US Geological Survey.[7]

The fraction of microspheres in the dust varied (between 0.2 and 1.3 % for USGS outdoor samples[8] and a mean of 5.87% for all RJ Lee samples[9]) depending on the area where the samples were taken. Due to their shape and density, the spheres were not likely to have traveled as far as other components of the dust. The diameter of the spheres in two evaluated dust samples ranged from about one micron (0.001 mm) to 1.5 mm.[10]



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The microspheres must have been formed at extremely high temperatures during the World Trade Center's destruction – temperatures exceeding the melting point of iron (~2,700° F). The spheres must have been molten when they were created in order to take their spherical shape. Such high temperatures could not have been produced by jet fuel or office building fires, which reach only up to 1,800 °F under the most severe fire conditions. However, the thermite reaction produces molten iron and aluminum oxide as the reaction products.[11] After being ejected into the atmosphere, molten iron droplets would be pulled into roughly spherical shapes by surface tension. They would then cool, solidify, and fall out – preserving in their spherical shape the information that they were once molten, and preserving in their chemical signature information about their origin.

This, along with the chemical makeup of the spheres, was first discussed by physicist Steven Jones and other scientists in two articles published in 2007[12] and 2008.[13] The chemical signature of several of the spheres shows significant amounts of aluminum, thus matching the signature of thermite residue but not that of steel. Some of these spheres also contain sulfur but no calcium. So the origin of the sulfur cannot be gypsum (from the buildings' wallboard). Thermate, a special thermite mixture developed by the military, contains sulfur. The chemical signature of many of the WTC dust spheres also "strikingly" matches that of the spheres and spheroids found in the residue of ignited red/gray nanothermite composite chips.[14]

Surely a new investigation is called for that takes into account the minimum 2800° F heat source necessary to create billions of molten iron droplets. Join AE911Truth and the burgeoning 9/11 Truth movement in our pursuit of real answers and accountability from governmental officials who were tasked with explaining the destruction of the WTC towers.

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**End Notes**

[1]http://www.ae911truth.org/documents/EPA_dust_SubGroupComments_110305_iron_spheres.pdf
[2]http://www.ae911truth.org/documents/nyenvirolaw_WTCDustSignatureCompositionAndMorphology.pdf
[3]http://www.ae911truth.org/documents/WTCDustSignature_ExpertReport.051304.1646.mp_.pdf
[4]http://pubs.usgs.gov/of/2005/1165/table_1.html
[5]http://pubs.usgs.gov/of/2005/1165/graphics/IRON-03-IMAGE.jpg
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[10]http://www.journalof911studies.com/articles/WTCHighTemp2.pdf
[11]http://www.journalof911studies.com/volume/200704/JonesWTC911SciMethod.pdf
[12]Ibid.
[13]http://www.journalof911studies.com/articles/WTCHighTemp2.pdf
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ARCHITECTS & ENGINEERS for 9/11 TRUTH

Focus On:
# World Trade Center 1 & 2

**August 2010**

## Advanced Pyrotechnic or Explosive Material Discovered in WTC Dust

Starting in 2007, a group of independent researchers began examining the dust from the World Trade Center disaster to see if identifiable residues might help explain the highly energetic destruction that was observed in the videos. Naked-eye and microscopic examination revealed numerous tiny metallic and magnetically attracted spheres and red/gray chips, quite distinctive in the dust samples.

The existence of iron-rich microspheres in the WTC dust was documented in 2004[1] and 2005.[2] But nothing yet had been published about the red/gray chips in the dust until Steven Jones first described them in 2007. What might have been misinterpreted as the residue of common paint when seen with the naked eye proved to be a highly energetic advanced nano-composite material.

In April 2009, a team of scientists that included physicist Steven Jones (formerly BYU), chemist Niels Harrit (University of Copenhagen, Denmark), physicist Jeffrey Farrer (BYU), and six other authors published their findings regarding the red/gray chips in the peer-reviewed paper "Active Thermitic Material Discovered in Dust from the 9/11 World Trade Center Catastrophe," The Open

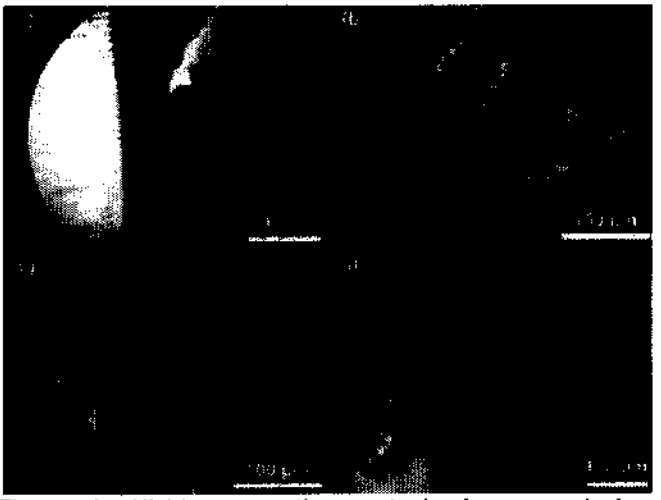

Figure 1: Highly energetic pyrotechenic or explosive red/gray chips discovered in WTC dust samples.

Chemical Physics Journal, 2009, 2, 7-31, available online.[3] Red/gray chips from four different WTC dust samples were examined using scanning electron microscopy, X-ray energy dispersive spectroscopy (XEDS), and differential scanning calorimetry. The main findings of the study are as follows:

The material in the red layer consists of intimately mixed particles of iron oxide and aluminum embedded in a carbon-rich matrix. The particles range in size from tens to hundreds of nanometers. Elemental aluminum was present in thin plate-like structures, while iron oxide was

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present as faceted grains, roughly 100 nm across – about a thousand times smaller than a human hair.

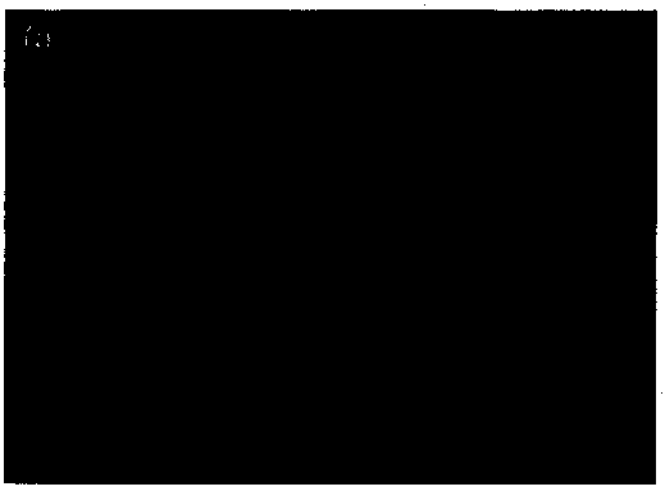

Figure 2: This 50,000X magnification REM/BSE image of a red/gray chip reveals uniform nano-sized faceted iron oxide particles (here whitish) and thin aluminum platelets embedded in a carbon-oxygen-silicon matrix.

Iron oxide and aluminum are the ingredients of classic thermite, an incendiary that burns unusually hot at approximately 4500°F, producing aluminum oxide and molten iron. The carbon content of the matrix indicates the presence of an organic substance.

When the red/gray chips were heated to about 430° C. (806° F.), they ignited, releasing relatively large amounts of energy very fast. This behavior matches "fairly closely an independent observation on a known super-thermite sample", as reported in a paper published by researchers associated with Lawrence Livermore National Laboratories. The residue of the ignited red/gray chips included iron-rich spheres, "indicating that a very high temperature reaction had occurred, since the iron-rich product clearly must have been molten to form these shapes." The chemical signature of the spheres and spheroids "strikingly matches the chemical signature of the spheroids produced by igniting commercial thermite, and also matches the signatures of many of the microspheres found in the WTC dust."

The scientists concluded based on all their findings that the red layer of the red/ gray chips "is active, unreacted thermitic material, incorporating nanotechnology," and that it "is a highly energetic pyrotechnic or explosive material." See the published study for the remainder of the findings.

Energetic nanothermitic compounds have been researched since the 1990s. One "advantage" of nanothermites as stated in the literature is their ability to enhance the destructive effect of high explosives; the high rate of reaction in nanothermites allows the main explosive charge to release its energy even faster when nanothermite is used as an igniter.[4] Such igniters also do not leave behind lead-containing residues as lead azide igniters do. Nanothermitic composite materials have been extensively researched by US national labs. The energy release of these special materials can be tailored for various applications,[5] they can be designed to be explosive by adding gas-releasing compounds[6] (such as what the matrix of the WTC chips' red layer might consist of) and they have potential for easy storage and safe handling.

As of 2002, the production process at the Naval Surface Warfare Center for ultra fine grain (UFG) aluminum, alone, required several pieces of high-tech equipment.[7] The article states: "The current state of UFG aluminum production is that this is an area that still requires considerable effort" (AMPTIAC Quarterly, Special Issue, "DOD Researchers Provide A Look Inside Nanotechnology," 2002).

Red/gray chips, with a red layer that comprises ultra fine grain aluminum platelets intimately mixed with faceted grains of nanosized iron oxide, embedded in a carbon-rich matrix, cannot have been widely available in 2001. Niels Harrit, lead author of the study, stated "These new findings confirm and extend the earlier finding of previously molten, iron-rich microspheres in the World Trade Center dust. They provide strong forensic evidence that the official explanation of the WTC's destruction is wrong."

Given the explosive nature of the destruction of the WTC Twin Towers along with the finding of this high-tech nanocomposite pyrotechnic or explosive material in the WTC dust samples, there exists strong evidence which should compel all who are aware to be active in supporting AE911Truth in our effort to obtain a real investigation.

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**End Notes**

[1]http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=239769
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[7]https://www.dsiac.org/about

ARCHITECTS & ENGINEERS for 9/11 TRUTH

# Focus On: World Trade Center 1 & 2

**August 2010**

## Evidence Destroyed Is Justice Denied

The destruction of the three World Trade Center skyscrapers on 9/11 caused the greatest loss of life and property damage in U.S. fire history and constituted the largest structural failures in world history. This event should have received the most thorough investigation of any event in history.

Even with ordinary house fires evidence is collected and an investigation is performed in order to determine the cause, especially if foul play is suspected. But the WTC investigations performed by the National Institute of Standards and Technology (NIST) were at best incomplete and at worst criminally fraudulent. FEMA cleanup workers and NIST engineers alike completely ignored the most obviously relevant and applicable recommendations of the National Fire Protection Association, NFPA 921, the nationally accepted guideline for fire and explosion investigation.

### Wholesale Destruction of Forensic Evidence

The 9/11 disaster scene in Manhattan, dubbed "Ground Zero," should have been treated as a crime scene in accordance with 9/11's immediate appellation "the Crime of the Century," in greater measure than simply as the scene of a terrorist attack that would immediately be labeled an "act of war." Certainly material and debris, where injured people might be trapped, had to be removed as quickly as practical. But, as important evidence, it should have been taken to a secure site for further investigation. NFPA 921 states:

"Once evidence has been removed from the scene, it should be maintained and not be destroyed or altered until others who have a reasonable interest in the matter have been notified." Moreover, after there was no reasonable hope of finding any more victims alive, there was no longer any need for the headlong rush to dispose of the steel.

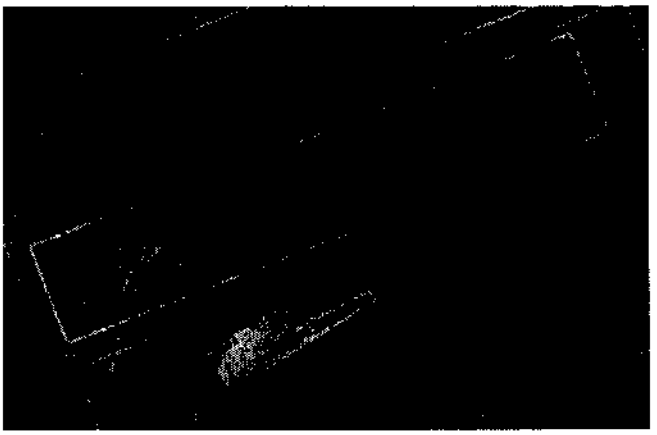

Figure 1: Instead of being analyzed to determine cause of failure, the WTC steel was rapidly shipped off to China for recycling.

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As the NIST report admitted, the three WTC skyscrapers whose destruction was blamed primarily on fire were the only cases of modern steel-framed high-rise buildings in world history to have ever completely collapsed because of fire. The structural steel was therefore extremely important evidence. Yet this evidence was quickly hauled away by up to 400 trucks per day and taken ... where? Not to a secure place to await inspection, but to barges where it was readied for shipping.

Figure 2: 400 truck-loads of steel per day were removed.

Instead of being analyzed to determine the cause of failure, the WTC steel framing pieces were rapidly shipped off to India and China for recycling. New York Mayor Rudi Giuliani, a former prosecutor, surely knew the importance of securing evidence – and that the law in fact requires it. Yet, of the 200,000 tons of structural steel contained in the Twin Towers, only a few hundred pieces were saved. And, only one piece of steel framing said to have come from WTC 7 was saved.

According to Erik Lawyer, founder of Firefighters for 9/11 Truth, officials in charge of the scene admitted that "the majority of the evidence was destroyed."[1] Building fire expert and editor-in-chief of *Fire Engineering* Magazine Bill Manning wrote, "Such destruction of evidence shows the astounding ignorance of government officials to the value of a thorough, scientific investigation...I have combed through our national standard for fire investigation, NFPA 921, but nowhere in it does one find an exemption allowing the destruction of evidence. To treat the September 11 incident any differently would be the height of stupidity and ignorance... The destruction and removal of evidence must stop immediately."

## Explosive Evidence Ignored

NIST ignored clear evidence of explosives and incendiaries in the destruction of all three high-rises. NIST excluded anything that happened after the so-called point of collapse initiation from the Twin Towers investigation despite that one of their stated "objectives" was to determine "how WTC 1 and WTC 2 collapsed."

Hundreds of first responders and others on the scene reported hearing explosions – yet NIST ignored them. More than 100 of these reports were recorded by orders of Fire Commissioner Thomas Von Essen in October of 2001,[2] but the City of New York withheld this key evidence until forced by the New York State Court of Appeals to release it in August 2005.

NFPA 921 calls for the consideration of the possibility of exotic accelerants or explosives when "pulverized concrete", "high order damage", and "lateral ejection of building elements" are found. Pulverized concrete covered all of lower Manhattan and comprised up to 30% of the WTC dust. The Twin Towers were completely destroyed down to their individual structural elements, and ejected as far as 600 feet.

NFPA 921 states that accelerants should be investigated in any fire crime scene and that molten steel may indicate the use of thermite, an incendiary and accelerant. Yet NIST did not look for thermite. Since then, however, independent scientists have found a high-tech version of thermite, known as nanothermite, in dust samples collected from the WTC site.[3] Previously molten iron micro-spheres had already been found in the WTC dust by USGS researchers and environmental engineers, further indicating high temperatures associated with the use of thermite.[4]

## Molten Metal and High-Temperature Phenomena Ignored

More than two-dozen eyewitnesses have reported seeing molten steel in the basements of all three WTC high-rises. This is confirmed by photos and verified by infrared satellite images indicating extremely high temperatures. Yet John Gross, Lead Engineer for NIST, denies even having heard any reports of molten metal at Ground Zero.[5]

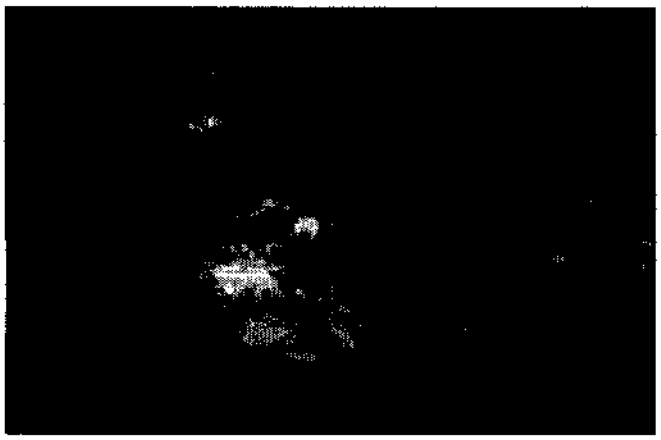

Figure 3: Molten metal witnessed by dozens completely omitted by NIST report.

NIST stated in 2007 on its website to have the "vision to lead the world in methods of measurement and prediction of the behavior of fire and its effects." Conspicuously, NIST never has shown any interest in investigating the unusual, allegedly fire-related, high temperature phenomena in the WTC collapse piles.[6]

## A Cover-Up?

It is clear that the actions by NYC/Port Authority officials, FEMA managers, and NIST engineers relative to the collection, preservation, and analysis of the evidence of this monumental crime looks more like a cover-up than an investigation. AE911Truth is dedicated to obtaining a real investigation that properly accounts for all the evidence and which uses the scientific method to analyze it. Join us in this historic pursuit of justice.

---

**End Notes**

[1] http://youtu.be/TULmLtqRXZ4
[2] http://www.911docs.net/graeme_macqueen.php
[3] http://www2.ae911truth.org/downloads/Full_Thermite_paper.pdf
[4] http://911research.wtc7.net/wtc/evidence/residues.html
[5] http://youtu.be/fs_ogSbOFbM
[6] http://www.ae911truth.org/news/41-articles/347-high-temperatures-persistent-heat-a-molten-steel-at-wtc-site-challenge-official-story.html

# Areas of Specific Concern in the NIST WTC Reports

*Below is a series of twenty-five provable points which clearly demonstrate that the reports produced by the National Institute of Standards and Technology (NIST) on the destruction of the World Trade Center (WTC) were unscientific and fraudulent. Therefore NIST itself – including its lead authors, Shyam Sunder and John Gross - should be investigated.*

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# WTC 7 – THE THIRD SKYSCRAPER

## 1. OMISSION OF GIRDER STIFFENERS SHOWN ON FRANKEL DRAWING #9114

**Technical Statement:** NIST maintains that WTC 7 collapsed due to fire acting upon the 13th floor A2001 girder between columns 79 and 44 and the beams framing into it from the east. They said that the beams expanded by 5.5" (revised in June 2012 to 6.25"), broke the girder erection bolts, and pushed this girder off its column 79 seat. This girder fell to floor 12, which then precipitated a cascade of floor failures from floor 12 down to floor 5, and column 79 then became unsupported laterally, causing it to buckle. It is then said that column 79's buckling caused the upper floors to cascade down, which started a chain reaction — a north-to-south then east-to-west horizontal, progressive collapse — with a global exterior collapse that was captured on the videos.

The first omission concerns flange-to-web stiffeners on the south end of the girder (A2001). See drawing 9114. These omitted stiffeners would prevent the girder flange from folding when the girder web moved beyond the seat, requiring twice the possible expansion of the beams framing into the girder from the east to move the girder far enough to the west for it to fall off its seat.

**References:**

- Frankel Shop Drawing #9114 https://www.dropbox.com/s/r009pjr3qhduyjg/9114.TIF?dl=0
  - Girder_A2001_Stiffeners_Plan_HL https://www.dropbox.com/s/jnt2f9i2vnm0wa3/Girder_A2001_Stiffeners_Plan.jpg?dl=0
  - Girder_A2001_Stiffeners_Elevation_HL https://www.dropbox.com/s/uy7cehcn2saorh1/Girder_A2001_%20Stiffeners_Elevation.jpg?dl=0

## 2. OMISSION OF THREE LATERAL SUPPORT BEAMS ON THE 13TH FLOOR G3005 BEAM

**Technical Statement:** NIST omitted three lateral support beams from the exterior frame to the north-most beam (G3005) framing into the A2001 girder between columns 44 and 79 from the east. The NIST WTC 7 report contains a second possible failure initiation mechanism, where G3005 buckles and causes the other four beams framing into the girder from the east (A3004, B3004, C3004, and K3004) to also buckle, lose their load-carrying capability, collapse downward, and rock (pull) the girder off its seats back to the east. When these lateral support beams are excluded in the NIST analysis, the beam slenderness is increased by 16 times, and this reduces the actual buckling load to 6% of what it would have been in reality. Analysis with the lateral support beams included shows that the beam would not buckle and that it would actually deflect the girder and put the other four beams in tension, eliminating any chance of them buckling, as beams and columns need to be in compression in order to buckle.

**References:**

- Frankel Shop Drawing #3005 https://www.dropbox.com/s/qoikgin4l8x0yub/3005.TIF?dl=0
- Frankel Shop Drawing #3007 https://www.dropbox.com/s/f9n62mr3c1mdvqs/3007.TIF?dl=0

- Frankel Shop Drawing #9150 https://www.dropbox.com/s/2fne2vd75p0yjcy/9150.TIF?dl=0
- Frankel Erection Drawing #E12/13
  https://www.dropbox.com/s/0rw4w6hc1ih8g2t/Erection_Drawing_1213.jpg?dl=0

## 3. WTC 7 COLLAPSE AT FREE-FALL ACCELERATION IS NOT EXPLAINED

**Technical Statement:** After initially denying it, NIST was ultimately forced into a public acknowledgement in their final report on WTC 7 that the building fell at full free-fall acceleration for 2.25 seconds, during which time it traversed the vertical distance of eight stories, or just over 100 feet. However, there is no attempt in the report to confront the implications that there could not have been any structural resistance during this eight-story fall at gravitational acceleration. Since every other skyscraper in history that has fallen in the manner in which WTC 7 did was an explosive controlled demolition, and since there is abundant eyewitness testimony of explosions and molten iron as well as chemical evidence of incendiaries found in the debris pile, one would expect NIST to at least consider the possibility of explosive or incendiary use and test for them, according to the National Fire Protection Association investigation standard NFPA 921: Guide for Fire and Explosion Investigations, which is strictly followed by the FDNY. Incredibly, NIST continues to refuse to test the remaining debris for explosives or incendiaries.

**References:**

- NCSTAR 1-9, Chapter 12
- NIST FAQ on WTC 7, updated 6/27/2012 http://www.nist.gov/el/disasterstudies/wtc/faqs_wtc7.cfm
- Physicist David Chandler's analysis of the descent of WTC 7 in three parts
  https://www.youtube.com/watch?v=Rkp-4sm5Ypc
  https://www.youtube.com/watch?v=iXTlaqXsm4k
  https://www.youtube.com/watch?v=v3mudruFzNw
- NFPA 921: Guide for Fire and Explosion Investigations
- Pertinent short clip from the documentary film, *9/11: Explosive Evidence—Experts Speak Out*
  https://www.youtube.com/watch?v=SBmyPW6gGGI

## 4. VIDEOS OF THE COLLAPSE OF WTC 7 BETRAY NIST'S COMPUTER MODEL

**Technical Statement:** The exterior of the NIST WTC 7 computer model shows large deformations, as would be expected in a natural collapse, but which are not observed in the video of the actual event. There is no attempt in the report to explain this discrepancy.

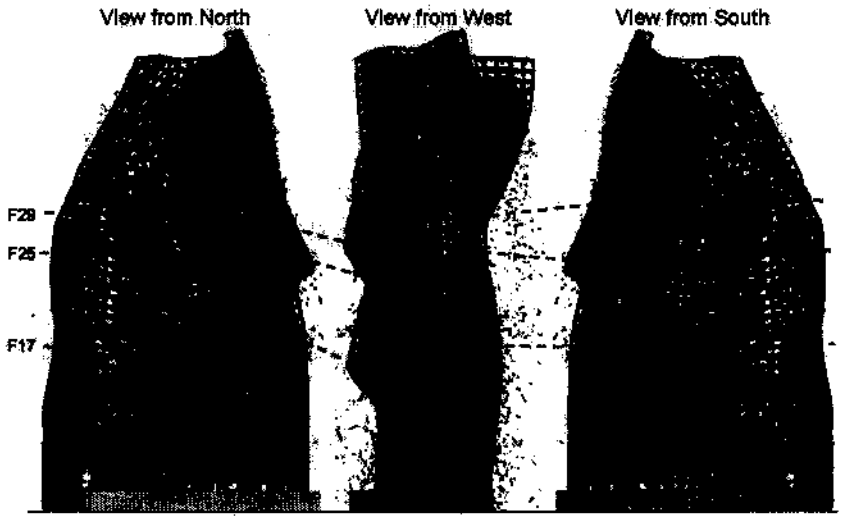
In footage of the actual collapse, the west penthouse and screen wall of WTC 7, which together span nearly half the length of the roof, start to fall one-half of a second prior to the full exterior collapse, yet the NIST report claims that the entire interior failed and completely collapsed prior to the exterior shell collapsing. Since there was little-to-no visible deformation of the exterior in the actual collapse and since the west penthouse and screen wall collapse timing indicates near-simultaneous interior and exterior failure, it seems clear that the severe deformation of the building's exterior in the NIST model shows that their model does not replicate the actual collapse situation at all. The west penthouse and screen

wall drop starting just prior to that of the exterior is also indicative of controlled demolition, where the interior columns are severed just a fraction of a second prior to the exterior, in order to create an inward pull on the exterior and keep the debris contained within the building's footprint.

**References:**

- Videos from September 11, 2001, showing the collapse of WTC 7
  http://www.youtube.com/watch?v=LD06SAf0p9A
  http://www.youtube.com/watch?v=AsJQKpnkZ10
- NCSTAR 1-9
- Pertinent short clip from the documentary film, *9/11: Explosive Evidence—Experts Speak Out*
  https://www.youtube.com/watch?v=4PEumpBtuy8

NIST WTC 7 exterior model results




## 5. CLAIMS OF INVESTIGATING CONTROLLED DEMOLITION WITHOUT TESTING FOR EXPLOSIVE RESIDUES

**Technical Statement:** In their WTC 7 FAQ, NIST claims to have investigated whether the building could have been brought down by controlled demolition and concluded that it was not. NIST says this even while admitting that they did not test for explosive residues in the rubble, after initially claiming that they "found no evidence of explosives or explosive residues" (while also making the simultaneous claim that no steel was saved from WTC 7 for analysis). Their conclusion is simply based on their claims that there were no sound levels measured which they feel would be indicative of the size of an explosion needed to destroy column 79 and that rigging the building in an undetected way would be difficult.

Belying the NIST argument that it would be difficult to rig WTC 7 without being detected, there was a secret retrofit of the Citibank Tower in New York City in 1978, due to an engineering error that could have allowed the building to topple in 70 mph winds. In that

case, after the problem was realized, secrecy was maintained to keep building occupants and nearby residents from panicking, though there was very little actual risk of danger. An evacuation plan for the building and surrounding area was drawn up, with the intent to implement it if high winds were imminent.

**References:**

- NIST FAQ on WTC 7, updated 6/27/2012 http://www.nist.gov/el/disasterstudies/wtc/faqs_wtc7.cfm
- The Secret Retrofit of the Citibank Tower in 1978 http://sciencehack.com/videos/view/O_ekNosnieQ
- Pertinent short clips from the documentary film, *9/11: Explosive Evidence—Experts Speak Out*
  - https://www.youtube.com/watch?v=u6X6ZbZ4H8w
  - https://www.youtube.com/watch?v=fTglkuffB0E
  - https://www.youtube.com/watch?v=Ri9ywmzewRQ

## 6. CHANGES OF STATEMENTS ON COMPOSITE BEAMS AND SHEAR STUD USE BETWEEN DRAFTS

**Technical Statement:** NIST's draft WTC 7 report said, "Most of the beams and girders were made composite with the slabs through the use of shear studs. Typically, the shear studs were 0.75 inches in diameter by 5 inches long, spaced 1 to 2 feet on center." However, in the final WTC 7 report, NIST says shear studs were *not* used on the girders. The significance here is that they claim the 13$^{th}$ floor A2001 girder was pushed off its seat at column 79 by thermally expanded beams from the east side of the building. If shear studs had been used on the girder, it would have been impossible for the beams to push the girder off its seat with the column. No drawings are shown in the final report to substantiate this new claim.

The contention is made that the shear studs on the beams are broken due to differential expansion of the steel and concrete, allowing the beams to freely expand and force the now non-shear-studded girder off its seat at column 79, causing floors 13 to 5 surrounding column 79 to collapse, leaving the column without sufficient lateral support and causing it to become unstable and to buckle. However, in some sections of their WTC 7 report, NIST does not heat the concrete, only the steel. Concrete has nearly the same Coefficient of Thermal Expansion (CTE) as steel and would expand and contract at almost the same rate when heated or cooled. There is no analysis or attempt to justify the position that the steel would have heated up to a greater degree than the concrete and produced a differential expansion. No physical testing was done to investigate the actual behavior of the materials involved; only computer modeling was performed, and in some cases without heating the concrete.

**References:**

- See attached copy of NIST NCSTAR 1-1 (Draft), p. 14
  http://web.archive.org/web/20051219234553/wtc.nist.gov/pubs/NISTNCSTAR1-1.pdf
- NCSTAR 1-1A, pp. 49, 50
- NCSTAR 1-9 Vol. 1, pp. 15, 341-360
- NCSTAR 1-9 Vol. 2, pp. 529, 534, 535, 546, 561, 603, 615

### 7. REFUSING OF FOIA REQUESTS

**Technical Statement:** A registered structural engineer's Freedom of Information Act (FOIA) request to NIST for calculations and analysis substantiating the walk-off failures of horizontal members from their seats, at columns 79 and 81, was denied in January 2010 by the director of NIST, who claimed that releasing this data "might jeopardize public safety." On the contrary, if it were a peculiar situation that NIST had discovered, it would be the refusal to release this information to the architects and engineers who are tasked with the public's safety that would be jeopardizing that very safety.

**References:**

- The NIST letter refusing to release calculations and analysis substantiating the walk-off failures at columns 79 and 81 is available at http://cryptome.org/wtc-nist-wtc7-no.pdf
- Pertinent short clip from the documentary film, *9/11: Explosive Evidence—Experts Speak Out* https://www.youtube.com/watch?v=u6X6ZbZ4H8w

## ALL THREE BUILDINGS

### 8. NEGLIGENCE IN SALVAGING STEEL

**Technical Statement:** At one point, NIST admitted that only 0.25% to 0.50 % of the steel from the Twin Towers was saved for analysis. Later, NIST claimed that none of the steel from WTC 7 was saved for analysis. At another time, NIST mentioned that Dr. John Gross was in the salvage yards and was involved in the selection of pieces of steel to save.

The NIST WTC Tower and WTC 7 reports do not explain why so little steel was saved and, incredibly, in the case of the Twin Towers, was dismissive when forced to admit that the steel saved from the buildings did not show that it had experienced high temperatures, by contending that "the sample size was not sufficient to be representative." Why didn't Dr. Gross save a sufficient sample size? The space required to store the steel would have been insignificant relative to the massive and historic issues to be resolved.

**References:**

- At 5:00 minutes into this video, Dr. John Gross says he was on the WTC site and in the steel yards early on http://www.youtube.com/watch?v=3SLIzSCt_cg
- NCSTAR 1-3, p. 27
- NCSTAR 1-3, Paragraph 6.6.2, p. 95
- Pertinent short clip from the documentary film, *9/11: Explosive Evidence—Experts Speak Out* https://www.youtube.com/watch?v=xPsVVdV6Dg0

### 9. IGNORING THE RESULTS OF FEMA 403, APPENDIX C

**Technical Statement:** NIST did not take the FEMA documentation of melted steel and sulfidation in its Appendix C forensic analysis as being indicative of something that could

have contributed to the collapses. Instead, NIST claims, without a basis, that the damage was caused in the rubble pile, although the extreme temperatures required to melt steel and the presence of sulfidation have no logical mechanism there.

In February 2012 an FOIA request produced three photos, taken during October 2001, showing Dr. John Gross of NIST posing with a heavily eroded WTC 7 beam. These photos contradict Dr. Gross' statements about not witnessing steel that had been subjected to high temperatures. In fact, Dr. Gross was on the team headed by Dr. Jonathan Barnett, who was responsible for discovering, during the FEMA investigation, the WTC 7 beam featured in the Appendix C forensic analysis, which was melted and sulfidated. This is one of the steel beams the ends of which Barnett had previously described as "partially evaporated." Such evaporation required temperatures exceeding 4,000° F.

**References:**

- FEMA World Trade Center Building Performance Study Appendix C
  http://www.fema.gov/pdf/library/fema403_apc.pdf
- Pertinent short clip from the documentary film, *9/11: Explosive Evidence—Experts Speak Out*
  https://www.youtube.com/watch?v=9oVs_94VHk8
- Photo below of NIST WTC 7 report leader John Gross in steel yards with melted and eroded steel

## 10. INVOLVEMENT IN NOT SAVING STEEL FOR INVESTIGATION

**Technical Statement:** In their initial draft report on the three building collapses, NIST claims that none of the steel from WTC 7 was saved for analysis. This is disconcerting, considering WTC 7 would have been the first steel-framed high-rise in history to ostensibly completely collapse due to fire.

Alarmingly, in their final report on WTC 7 in November 2008, NIST makes no mention of the fact that no steel was saved from WTC 7 for analysis.

This is confusing, as we now know that Dr. John Gross was involved as early as October 2001 in selecting pieces of steel to save for the NIST investigations into the failures of all three buildings.

**References:**

- NIST NCSTAR 1-3D (Draft), pp. 271, 273
  http://web.archive.org/web/20060221020101/wtc.nist.gov/pubs/NISTNCSTAR1-3DDraft.pdf
- Pertinent short clip from the documentary film, *9/11: Explosive Evidence—Experts Speak Out*
  https://www.youtube.com/watch?v=xPsVVdV6Dg0

## 11. FIRE SIMULATIONS AND DURATIONS ARE EXAGGERATED

**Technical Statement:** The fire severity and durations shown in the NIST reports do not match the observations in the videos of all three skyscrapers. They are highly exaggerated. The actual fires, particularly in WTC 2, are nearly exhausted, with thick black smoke indicating cooler fires. The WTC 7 fires are few, small, and scattered. On floor 12, the location of the fires that NIST claims to have caused the initiation of collapse due to thermal expansion are shown to be burned out more than one hour prior to the building's fall. Thus they could not have been responsible for WTC 7's destruction, as the expanding beams would have cooled and contracted by then.

**References:**

- NCSTAR 1-5, 1-5A, 1-5B, 1-5C, 1-5E, 1-5G
- E. Douglas, "The NIST WTC Investigation--How Real Was The Simulation?" *Journal of 9/11 Studies*, Vol. 6, pp. 1-27, December 2006
  http://www.journalof911studies.com/volume/200612/NIST-WTC-Investigation.pdf
- http://www.ae911truth.org/downloads/WTC_fire_sim_comparison_080912c.pdf
- Pertinent short clip from the documentary film, *9/11: Explosive Evidence—Experts Speak Out*
  https://www.youtube.com/watch?v=Q5pydjc9aSU

## 12. NO DISCUSSION OF THE MOLTEN METAL FOUND IN THE RUBBLE OF THE THREE COLLAPSED BUILDINGS

**Technical Statement:** Dr. John Gross has denied that there is evidence of molten iron/steel in the rubble of the three collapsed buildings, despite numerous eyewitnesses testifying to this and despite the physical evidence of what have come to be called "meteorites," which are made up of solidified slag from pools of molten iron and steel that were "flowing like lava," according to firefighters. Again, the significance here is that the temperatures which can be achieved by diffuse flame hydrocarbon or office fires range from 600° to a maximum of 1,800° F, which is well below the 2,750° F initial melting temperature of steel and iron.

**References:**

- Video with John Gross claiming he knows of no one who saw molten metal in the rubble of the three collapsed buildings http://www.youtube.com/watch?v=3SLIzSCt_cg and http://www.youtube.com/watch?v=fs_ogSbQFbM
- Pertinent short clips from the documentary film, *9/11: Explosive Evidence—Experts Speak Out*
  - https://www.youtube.com/watch?v=9oVs_94VHk8
  - https://www.youtube.com/watch?v=Ri9ywmzewRQ

## 13. REFUSAL TO TEST FOR EXPLOSIVE RESIDUE

**Technical Statement:** NIST has admitted that they did not test for explosives, and their director of public relations is on record saying, "If you are going to test for something that is not there, you are wasting your time and the taxpayers' money." In the oral histories taken down in late 2001 and early 2002 from New York City emergency personnel, there are over 100 individuals who make comments about seeing, hearing, and experiencing explosions.

These oral histories were documented well before NIST started their WTC investigation in September 2002. This testimony should have caused the presumption that there was a good chance explosive residue would be found — and justified testing for it rather than the opposite. On what basis would NIST have presumed that there was little chance of explosive residue to be found and that it would be a waste of time and money?

NIST acknowledges in their response to a Request for Correction submitted by AE911Truth that they are "unable to provide a full explanation of the total collapse." And yet NIST refused to consider the possibility that explosives could have been used to cause the collapses of the Twin Towers — though controlled demolition is consistent with all of the available technical evidence.

**References:**


- J. Abel, "Theories of 9/11," *Hartford Advocate*, Hartford, Connecticut, January 29, 2008 http://web.archive.org/web/20080430203236/http://www.hartfordadvocate.com/article.cfm?aid=5546
- The September 11 records via *The New York Times* http://graphics8.nytimes.com/packages/html/nyregion/20050812_WTC_GRAPHIC/met_WTC_histories_full_01.html
- G. MacQueen, "118 Witnesses: The Firefighters' Testimony to Explosions in the Twin Towers," *Journal of 9/11 Studies*, Vol. 2, pp. 1-60, August 2006 http://www.journalof911studies.com/articles/Article_5_118Witnesses_WorldTradeCenter.pdf
- Request for Correction of the NIST WTC report http://stj911.org/actions/NIST_DQA_Petition.pdf
- NIST's answer to the above Request for Correction http://www.journalof911studies.com/volume/2007/NISTresponseToRequestForCorrectionGourleyEtal2.pdf
- NIST August 2006 FAQ http://www.nist.gov/public_affairs/factsheet/wtc_faqs_082006.cfm
- Dr. David Ray Griffin's essay, "The Destruction of the World Trade Center: Why the Official Account Cannot Be True" http://911review.com/articles/griffin/nyc1.html
- Pertinent short clips from the documentary film, *9/11: Explosive Evidence—Experts Speak Out*
  - https://www.youtube.com/watch?v=u6X6ZbZ4H8w
  - https://www.youtube.com/watch?v=fTglkuffB0E

### 14. FAILURE TO FOLLOW STANDARD FIRE INVESTIGATION PROTOCOL

**Technical Statement:** NIST and FEMA did not follow standard procedure for fire and explosion investigations. This is covered in the National Fire Protection Association's investigation standard NFPA 921, Guide for Fire and Explosion Investigations, where it is clearly stated that looking for explosive residues and accelerants is the standard procedure for fire and explosion investigations. NFPA 921 also states that if they are not tested for one should be prepared to explain why they weren't.

NIST is often responsible for generating information from which the NFPA standards are written. Why would the NFPA standard not be followed in this case? NIST has not answered this question publicly.

**References:**

- National Fire Protection Association, "Guide for Fire and Explosion Investigations," NFPA 921
- Pertinent short clips from the documentary film, *9/11: Explosive Evidence--Experts Speak Out*
  - https://www.youtube.com/watch?v=u6X6ZbZ4H8w
  - https://www.youtube.com/watch?v=Q5pydjc9aSU

## THE TWIN TOWERS

### 15. STRIPPING OF THE FIRE PROOFING IS EXAGGERATED

**Technical Statement:** NIST claims that the aircraft impact debris in WTC 1 stripped the fireproofing materials from the floor truss assemblies — even on the opposite side of the building from the impact — to the point where the floor assembly steel was then vulnerable to fire. NIST attempted to validate this hypothesis with ballistic firing equipment, firing buckshot and shrapnel at steel plates and bars coated with SFRM (Sprayed on Fire Resistant Material). During the testing, the gun was fired at velocities of approximately 500 ft/s and produced damage to the SFRM, but at one point it misfired and produced a projectile velocity of just 102 ft/s (31 m/s), which resulted in no damage to the SFRM.

WTC 1 was impacted on the north side of the building. NIST claims that the fireproofing was stripped from the trusses on the south side, causing them to sag and pull the south face of the building inward, initiating the collapse. However, NIST's own analysis of the aircraft's deceleration, 0.40 seconds after impacting WTC 1 on the north face, shows the debris field moving at approximately 51 ft/s (15 m/s) as it enters the floor assembly area on the south side of the building. How can NIST justify the aircraft debris damaging the SFRM on the floor assembly steel on the south side of the building when their own testing and analyses seem to rule it out?

**References:**

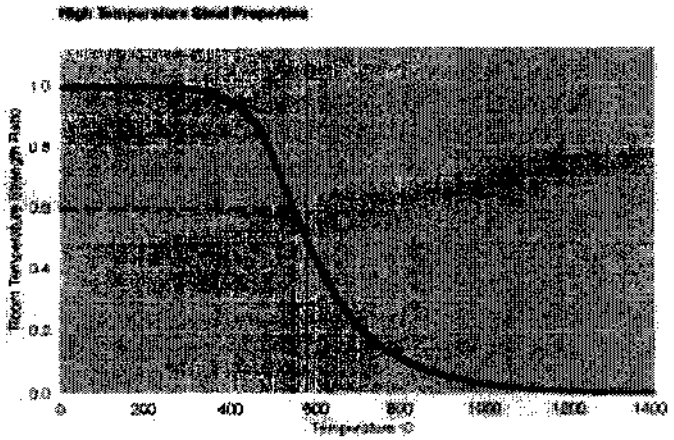
- NCSTAR 1-6A, Appendix C, pp. 263 to 274
- NCSTAR 1-2, pp. 171 to 180

## 16. PRE-COLLAPSE STEEL TEMPERATURES ARE EXAGGERATED

**Technical Statement:** NIST's own physical testing for actual steel temperatures on the 236 pieces they selected from the Twin Towers in the areas closest to the hottest fires showed that only three pieces had experienced temperatures above 250° C — a temperature where steel has not yet lost any strength. Of those three, none had experienced temperatures beyond 600° C, the point at which structural steel loses about half its strength. Note this critical zone in the graph below. NIST's own physical evidence shows that the vast majority of the steel had not experienced temperatures where it lost any strength, though in the report NIST claims a large number of steel structural members would have been heated to temperatures of 700° C.

**References:**

- NCSTAR 1-3C Chapter 6
- NCSTAR 1-3 paragraph 6.6.2, p. 95
- NCSTAR 1-5B Chapter 11
- NCSTAR 1-5G
- *Pertinent short clip from the documentary film, 9/11*: Explosive Evidence—Experts Speak Out https://www.youtube.com/watch?v=c18kPAtkJh0
- Below, chart from Corus Construction showing steel strength at increased temperature compared to room temperature strength




## 17. TESTED FLOOR ASSEMBLIES DID NOT FAIL

**Technical Statement:** NIST hired Underwriter Laboratories to perform testing of the Twin Tower floor assemblies per ASTM E119 in a two-hour, 2,000° F fire test. During the tests, the main trusses did not fail — and sagged only 4" after 60 minutes and 6" after 100 minutes, which were the approximate durations of the fires in WTC 2 and WTC 1, respectively. NIST was clearly not using these test results as their basis when they showed the main trusses sagging more than 40" in their models.

**References:**

- NCSTAR 1-6B, Chapters 4 and 5

- NCSTAR 1-6C
- Anonymous and F. Legge, "Falsifiability and the NIST WTC Report: A Study in Theoretical Adequacy," *Journal of 9/11 Studies*, Vol. 29, pp. 1-20, March 2010 http://www.journalof911studies.com/volume/2010/Falsifiability.pdf

## 18. INITIATION OF COLLAPSE – "INWARD BOWING" WAS INDUCED ARTIFICIALLY

**Technical Statement:** The NIST report claims that the collapse of WTC 1 was initiated by the south exterior wall buckling. The report claims that this was due to "inward bowing" and buckling of the exterior columns — alleged to be caused by sagging of the floor trusses. However, the NIST computer model did not show this to occur with natural inputs and sagging floor trusses. To actually cause the perimeter column failure, an artificial lateral load of 5,000 lbs. had to be applied to each perimeter column from the outside of the building. In reality, there was of course no such force available.

NIST claims, in a circular argument, that this artificial lateral load was applied to the exterior columns in an attempt to match the observed inward bowing, even though their model could not produce it naturally with their theory of sagging trusses causing it. It is much more likely that the core columns, which would have been falling after their failure was caused by explosives or incendiaries, would have pulled on the trusses with great force, generating the observed inward bowing of the exterior columns to which the opposite end of the trusses were attached.

**References:**
- NCSTAR 1-6D, pp. 180, 181, Chapter 5, and Appendix A

## 19. COLUMN STRESS DUE TO LOAD REDISTRIBUTION IS NOT SUFFICIENT TO CAUSE FAILURE

**Technical Statement:** The analysis in the NIST WTC report for the columns of the east and west perimeter walls of WTC 1 shows that after a south wall failure, the additional loads on these columns increase their total stress to only about 30% of their yield strength. This amount of stress cannot cause failure. Although this is not stated specifically, it can be deduced, because NIST provides their "in-service load" and the additional load carried due to "redistribution." In spite of this, NIST simply makes the claim that once the south wall buckled, the instability somehow "spread across the rest of the building."

**References:**
- NCSTAR 1-6, pp. 301, 304
- NCSTAR 1-6D, Chapters 4 and 5

## 20. NO EXPLANATION GIVEN FOR HORIZONTAL PROPAGATION OF COLLAPSE

**Technical Statement:** The NIST WTC report acknowledges that it does not provide a technical analysis of the structural behavior of the Twin Towers during the collapse itself.

The report stops its analyses for both towers at the point of collapse initiation where the claim is made that "the tower was poised to collapse." It simply suggests that "global collapse naturally followed" and then depends upon a paper written by Northwestern University civil engineering professor Zdenek Bazant for an explanation of how the collapse could continue (a complex study that was, interestingly, submitted just two days after 9/11/01).

However, Dr. Bazant starts his analysis *after* the upper section of the building has already fallen one story. Since NIST actually stopped their analysis at an alleged south exterior wall failure in WTC 1 and east exterior wall failure in WTC 2, prior to any "fall" at all, this leaves completely unexplained how these partial failures could have propagated *across* the building, to cause the collapses of the full upper sections of the buildings. In fact, what is seen in the videos is quite different from anything modeled, or claimed, by NIST. The videos show a "disintegration" of the initiating zone at the onset of each collapse. The upper 12-story section of the North Tower destroys itself in the first four seconds of the building's collapse — almost in a telescoping internal implosion like a controlled explosive demolition — such that it is not even available as a mass, after the initial four seconds of the "collapse," to act as the "pile driver" propelling the rest of the building down to the ground, as is alleged by NIST and Bazant.

**References:**

- NCSTAR 1-6D, p. 314
- NCSTAR 1-6, pp. lxvii, lxix, 300, 304, 308, 309, 323
- Slow-motion video from the northwest of WTC 1 collapse initiation http://www.youtube.com/watch?v=y9-owhlIM9k

## 21. WTC 1 TILT OCCURRED AFTER SYMMETRICAL COLLAPSE FOR AT LEAST TWO STORIES

**Technical Statement:** The NIST report claims that WTC 1 tilted 8° to the south and then began its descent. There is no analysis provided to back this assertion. Analyses of video by individual researchers have shown only a very small tilt of 1° or less prior to the descent of the upper 12 stories, and only after at least a two-story vertical drop was there a larger tilt of 8° to the south. Most or all of the columns on the 98$^{th}$ floor, where the collapse initiated, must have failed simultaneously in order to allow the initial symmetrical descent at two-thirds of free-fall acceleration, destroying the upper 12-story block in the first four seconds. The only mechanism available for such destruction or failure of columns is timed-sequenced explosives — typical in controlled implosions. This sudden collapse, which could only have been the result of instantaneous column destruction, also refutes the NIST assertion that a south wall failure precipitated a gradual south-to-north failure.

**References:**

- NCSTAR 1-6D, p. 314
- NCSTAR 1-6, pp. lxvii, 304
- Slow-motion video from the northwest of WTC 1 collapse initiation http://www.youtube.com/watch?v=y9-owhlIM9k

- Pertinent short clip from the documentary film, *9/11: Explosive Evidence—Experts Speak Out* https://www.youtube.com/watch?v=nC0eQ3_FUs0&list=PLUshF3H0xxH2FFyiA3OZnLA7WfiNxJmcO&index=11

## 22. NO JOLT – CONTINUOUS ACCELERATION OF COLLAPSE WAS IGNORED

**Technical Statement:** In his papers, Dr. Zdenek Bazant claims that an "amplified dynamic load" occurred at the impact between the Twin Towers' falling upper section and the structure below, and that this is what caused the reserve strength of the structure below to be overcome by the otherwise insufficient static load above. However, by definition, the generation of an amplified load requires a deceleration upon impact, and a velocity loss would be a necessary result of such deceleration.

Since Dr. Bazant's first paper was written and published, the rate of fall of the upper section of WTC 1 has actually been measured by a number of individual researchers. Dr. Bazant initially neglected this simple analysis in his paper submitted to the *Journal of Engineering Mechanics* on Sept. 13, 2001, only two days after the event. These measurements all show that the upper section never decelerates and never experiences velocity loss. In fact, the upper section of WTC 1 continuously accelerates at approximately 64% of the rate of gravity. By contrast, building demolitions that use the Verinage technique, where gravity alone is used to demolish the structure below after a fall of a couple of stories instigated by mechanical means such as hydraulic rams breaking the columns, a clear deceleration and velocity loss is observed when the upper section impacts the lower.

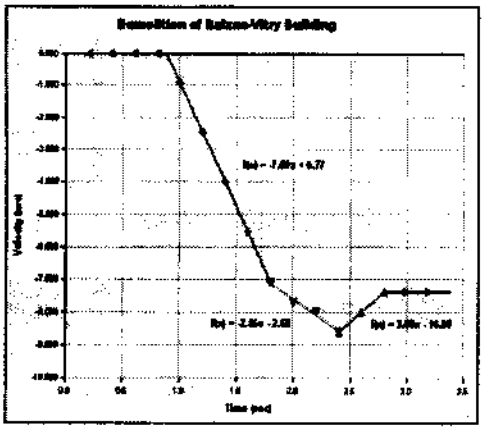
All of Dr. Bazant's papers use free-fall acceleration through the first story and the maximum design load mass of the falling upper section. Neither of these are representative of the actual situation, so this causes an embellishment of the upper section's kinetic energy in his papers. He also significantly underestimates the energy dissipation due to column deformation during impact. Dr. Bazant has been made aware of these problems with his hypothesis, and in January 2011 he had a paper published by the *Journal of Engineering Mechanics* where, with a graduate student as his co-author, he tried to claim the deceleration would not be observable. This paper has been shown to use fraudulent values for both inertial and column deformation energy losses. However, NIST continues to use his work.

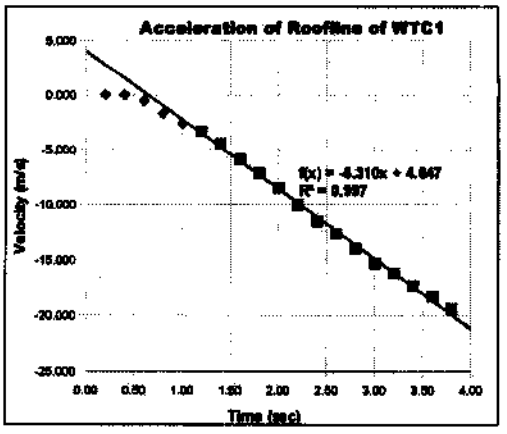
Recent research using test results *vs.* the three-hinge method for estimating energy dissipation caused by plastic hinge formation in axially-loaded buckling columns has shown the three-hinge method to significantly underestimate it — and this is without using fraudulently low column plastic moment (Mp) values, as Le and Bazant did in their paper. This research provides even more support for the contention that the lack of deceleration in the descent of WTC 1 is a severe impediment for a natural-collapse scenario.
The velocity graphs of the upper sections of both a building demolished by the Verinage technique and that of WTC 1 are shown below. Note the abrupt reduction of velocity in the *natural* force collapse using the Verinage demolition method on the Balzac-Vitry building in France *vs.* the *continuous* acceleration of WTC 1. The columns in WTC 1 must have been

"removed" prior to impact. This can only be done by explosives — for which there is abundant evidence, as outlined in the documentary film, *9/11: Explosive Evidence—Experts Speak Out*.

**References:**


- NCSTAR 1-6, p. 323
- Z. Bazant and Y. Zhou, "Why Did the World Trade Center Collapse?—Simple Analysis," *Journal of Engineering Mechanics*, pp. 1-7, January 2002 http://www.civil.northwestern.edu/people/bazant/PDFs/Papers/405.pdf
- G. MacQueen and T. Szamboti, "The Missing Jolt: A Simple Refutation of the NIST/Bazant Collapse Hypothesis," *Journal of 9/11 Studies*, Vol. 24, pp. 1-27, January 2009 http://www.journalof911studies.com/volume/2008/TheMissingJolt7.pdf
- D. Chandler, "Destruction of the World Trade Center North Tower and Fundamental Physics," *Journal of 9/11 Studies*, Vol. 28, pp. 1-17, February 2010 http://www.journalof911studies.com/volume/2010/ChandlerDownwardAccelerationOfWTC1.pdf
- "9/11 – North Tower Acceleration," David Chandler http://www.youtube.com/watch?v=28ds5sFvTG8
- Video: "What a Gravity-Driven Demolition Looks Like" https://www.youtube.com/watch?v=NiHeCjZlkr8
- Jia-Liang Le and Z. Bazant, "Why the Observed Motion History of the World Trade Center Towers is Smooth," *Journal of Engineering Mechanics*, pp. 82-84, January 2011 http://www.civil.northwestern.edu/people/bazant/PDFs/Papers/405.pdf
- T. Szamboti and R. Johns, "ASCE Journals refuse to correct fraudulent paper they published on WTC collapses," Letter in *Journal of 9/11 Studies*, September 2014 http://www.journalof911studies.com/resources/2014SepLetterSzambotiJohns.pdf
- R.M. Korol and K.S. Sivakumaran, "Reassessing the Plastic Hinge Model for Energy Dissipation of Axially Loaded Columns," *Journal of Structures*, Vol. 2014, Article ID 795257, 7 pages, February 2014 http://www.hindawi.com/journals/jstruc/2014/795257
- Pertinent short clips from the documentary film, *9/11: Explosive Evidence—Experts Speak Out*
  - https://www.youtube.com/watch?v=nC0eQ3_FUs0
  - https://www.youtube.com/watch?v=CYCuAa0eFKg
- Two velocity charts below



## 23. NO PILE DRIVER IS OBSERVED IN VIDEOS

**Technical Statement:** NIST claims that the "upper section" of each of the Twin Towers crushed the lower section. However, video analysis clearly reveals that the upper section's structure (above the point of jet plane impacts) disintegrated significantly prior to any *crushing* of the lower block. After this point some other set of forces must be destroying the buildings. A closer look at the videos reveals those sources to be a series of explosions racing down the corners of the building, under the zone of destruction, at a rate equal to about two-thirds of free-fall acceleration.

**References:**

- NCSTAR 1-6D, p. 314
- Slow-motion video of WTC 1 collapse initiation
  http://www.youtube.com/watch?v=y9-owhlIM9k
- Video: "Acceleration + Serendipity" by David Chandler
  http://www.youtube.com/watch?v=i9M1iufUAVA
- Pertinent short clips from the documentary film, *9/11: Explosive Evidence—Experts Speak Out*
  - https://www.youtube.com/watch?v=nC0eQ3_FUs0
  - https://www.youtube.com/watch?v=fTglkuffB0E

## 24. COLUMN LOADS WERE CALCULATED FOR WORST CASE, NOT ACTUAL IN-SERVICE LOADS

**Technical Statement:** NIST calculates the DCR (Demand-to-Capacity Ratio, which is the reciprocal of factor of safety) of the tower columns for a worst-case design load, not the actual in-service load. As a result, the reader is left with the impression that the tower columns were less robust relative to the load they were carrying than they were in reality. A failure analysis normally uses the actual in-service load and provides the actual DCR, or factor of safety, during failure.

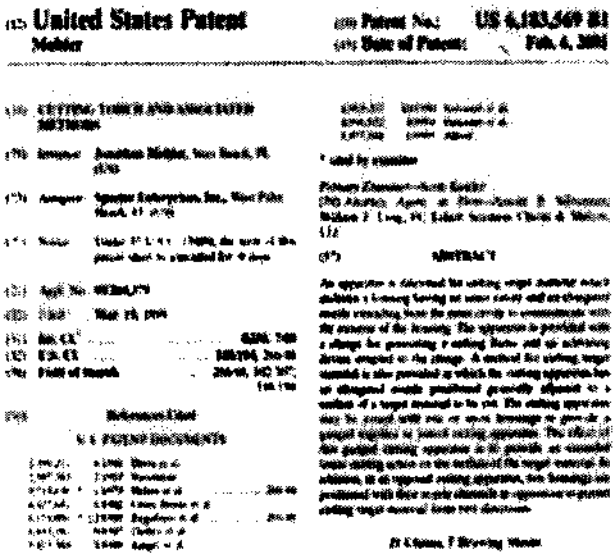
**References:**

- NCSTAR 1-2A
- NCSTAR 1-6D
- Released core column cross sectional and material strength data
  http://femr2.ucoz.com/photo/core_data/10
- Mass analysis of WTC 1
  http://www.journalof911studies.com/volume/200703/GUrich/MassAndPeWtc.pdf
- Pertinent short clip from the documentary film, *9/11: Explosive Evidence—Experts Speak Out*
  https://www.youtube.com/watch?v=nC0eQ3_FUs0

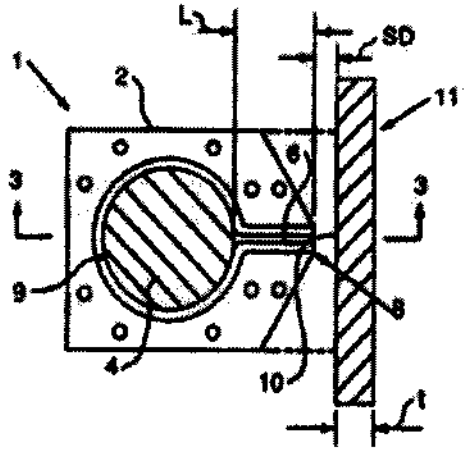
## 25. MOLTEN METAL OBSERVED POURING OUT OF THE CORNER OF WTC 2 REMAINS UNRESOLVED

**Technical Statement:** NIST has not adequately explained the yellow-orange fluorescing molten metal observed pouring out of the northeast corner of the 78$^{th}$ floor of WTC 2 shortly before its collapse. In a FAQ article, they claimed that it could have been aluminum.

However, when it was explained to them that aluminum fluoresces as a silvery color, they postulated that the aluminum could have been mixed with organics to give it the yellow-orange glow. When physics professor Dr. Steven Jones performed an experiment by adding organics to molten aluminum, they did not mix. The organics consistently floated to the top, no matter how thoroughly they were mixed into the molten aluminum. The significance here is that the maximum temperatures which can be achieved by diffuse flame hydrocarbon (jet fuel or office fires) is in the range of 600° to a maximum of 1,800° F, well below the 2,750° F minimum melting temperature of steel or iron (which *does* fluoresce yellow-orange in its molten state). Further chemical tests by Dr. Jones on samples of solidified molten metal slag from the WTC site found that it was indeed molten iron — and that the molten iron had the chemical evidence of thermite in it. Thermite is an incendiary designed to cut through steel like a hot knife through butter — particularly when used in a patented cutter charge device designed to eject liquid molten iron in just milliseconds, as described in the text of the patented thermite cutter charge device shown below.



United States Patent




There has been no further response from NIST on this issue.

**References:**

- Videos of molten metal pouring from the northeast corner of WTC 2 moments before collapse
  https://www.youtube.com/watch?v=aMBTp27k_wE
  https://www.youtube.com/watch?v=LivXaOguXRA
- Question #21 in NIST WTC FAQ
  http://www.nist.gov/el/disasterstudies/wtc/faqs_wtctowers.cfm
- Pertinent short clip from the documentary film, *9/11: Explosive Evidence—Experts Speak Out*
  https://www.youtube.com/watch?v=9oVs_94VHk8

ARCHITECTS & ENGINEERS for 9/11 TRUTH

Focus On:
The NIST Reports

March 2010

# The NIST Analyses: A Close Look at WTC 7

*by Ronald H. Brookman, SE*

## Preface

The following comments and questions describe why I consider the Final Reports NCSTAR 1A, 1-9 and 1-9A to be incomplete, inconsistent and erroneous. Sincere thanks are due to Chris Sarns, Gregg Roberts, David Chandler and Dwain Deets for their helpful comments. I hope many others will spend the time to evaluate the NCSTAR reports carefully, follow the references herein, and draw their own conclusion. Public disclosure of one's convictions is always a risk, but silent acceptance is not an option. Permission is granted to reprint or quote excerpts freely and solely without charge.

## Introduction

Many architects, engineers and others have never seen the rapid descent of the 47-story World Trade Center Building Seven (WTC 7) into its footprint in less than seven seconds on the afternoon of September 11, 2001. This unprecedented event—the first steel-frame building in history to collapse suddenly and completely following an uncontrolled office fire—was captured on film from various angles. Engineers at the National Institute of Standards and Technology (NIST) performed extensive thermal and structural analyses of the building in an attempt to explain the complete collapse in terms of impact damage, fire damage, column buckling and progressive collapse. This extraordinary effort by NIST provides a close-up view inside WTC 7 during the final hours, minutes and seconds before its precipitous fall. But the discovery of extreme temperatures as well as residues of molten iron and highly reactive pyrotechnic material in the World Trade Center debris[1] [2] [3] invalidates the NIST conclusions, and further independent investigation is required.

The purpose of this article is to closely examine the contents of the final National Construction Safety Team Act Report (NCSTAR)[4] numbers 1A, 1-9 and 1-9A in an effort to understand the NIST

[1] Niels H. Harrit et al., "Active Thermitic Material Discovered in Dust from the 9/11 World Trade Center Catastrophe", The Open Chemical Physics Journal, 2009, Volume 2.
[2] Steven E. Jones et al., "Extremely High Temperatures during the World Trade Center Destruction", Journal of 9/11 Studies, Volume 19, January 2008.
[3] Jonathan Barnett et al., FEMA 403, World Trade Center Building Performance Study: Data Collection, Preliminary Observations, and Recommendations, May 2002, Appendix C, "Limited Metallurgical Examination".
[4] All of the NCSTAR reports can be found at http://wtc.nist.gov.

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hypotheses, methods of analysis and conclusions. Careful examination is necessary to verify how NIST has fulfilled its duty to the public as required by the National Construction Safety Team (NCST) Act of 2002.[5] One of the duties charged to NIST under this law is to establish the most likely technical cause of the building failure; NIST has succeeded in casting serious doubt on the credibility of its conclusions by focusing solely on the analytical aspects and by ignoring relevant physical and testimonial evidence. This article does not constitute proof that explosives were present in the building. Simply demonstrating that NIST has not fulfilled its mandatory duty to the public is sufficient grounds to call for a new investigation of the incident, and any meaningful investigation must account for all of the relevant evidence. More than a year has elapsed since the final reports were issued in November 2008, and the goal of this article is to establish agreement—supported by facts—that a new investigation is necessary to explain the complete destruction of WTC 7.

Anyone reading this article knows the events of 9/11 have changed our lives. The "global war on terror" was immediately declared, and wars in Afghanistan and Iraq were initiated. These wars continue—more than eight years later—with no clear goal and no end in sight. Many citizens worldwide consider the "Muslim hijacker" conspiracy theory promoted by media and government sources to be false, and there is still no hard evidence to confirm its veracity. Many citizens worldwide also know that an understanding of 9/11 is essential to achieving a peaceful resolution to current conflicts. This effort is dedicated to the thousands of innocent victims of 9/11 and their families including citizens of Iraq and Afghanistan, the first responders, survivors, witnesses, friends and colleagues who continue to search for honest answers to extremely difficult questions.

## The NIST Hypothesis

The NIST authors have not proven their hypothesis regarding the fate of WTC 7. The summary report allegedly "describes how the fires that followed the impact of debris from the collapse of WTC 1 (the north tower) led to the collapse of WTC 7;"[6] the report actually describes the NIST hypothesis for a fire-induced collapse of WTC 7 based on complex computer simulations. The NIST conclusions are not based on physical evidence that can be tested and confirmed by others. NIST frequently uses the term "probable collapse sequence"[7] to describe their hypothesis, but their report never quantifies this probability. A preliminary study of WTC 7 published by the Federal Emergency Management Agency (FEMA)[8] concluded that the best hypothesis of a fire-induced collapse had only a low probability of occurrence, so the NIST conclusions still reflect a significant degree of uncertainty.

Various hypotheses were considered for the initiation of complete global collapse. The possibilities considered by NIST included (1) a fire-induced local failure leading to vertical and horizontal failure progression throughout the entire structural system, (2) a fire-induced failure from burning diesel fuel leading to complete

[5] U.S. Congress, H.R. 4687, "National Construction Safety Team Act", 107th Congress, 2nd Session, January 2002.

[6] S. Shyam Sunder et al., NIST NCSTAR 1A, Final Report on the Collapse of World Trade Center Building 7, Washington: U.S. Government Printing Office, November 2008, p. xv.

[7] NCSTAR 1A, p. xv.

[8] Ramon Gilsanz et al., FEMA 403, Ch. 5, "WTC 7", p. 5-31.

global collapse, and (3) a blast-induced demolition scenario. According to NIST:

> *The leading hypothesis for the failure sequence that characterized the initial local failure was based on fire-induced failure events in the tenant floors.*[9]

A heat-induced column failure hypothesis was quickly ruled out after concluding the fires were not hot enough for the duration of time required to reduce the steel strength by 50 percent.

> *Therefore, it would not have been possible for a building contents fire to have heated a massive, insulated column such as Column 79 to the point of failure.*[10]

The NCST Act was signed into law in 2002, and it specifies NIST's responsibility to "establish the likely technical cause or causes of the building failure;" the focus of the WTC 7 investigation as defined by NIST is not the same as establishing the likely cause of collapse.

> *The challenge was to determine if a fire-induced floor system failure could occur in WTC 7 under an ordinary building contents fire.*[11]

In its brief dismissal of the controlled demolition scenario, NIST argues that careful preparation of columns for demolition could not be accomplished without detection, and "Controlled demolition usually prepares most, if not all, interior columns in a building with explosive charges, not just one column."[12] While NCSTAR authors imply that demolition of multiple columns would be required and unlikely, the same authors conclude that the buckling failure of a single column was sufficient to trigger a complete progressive collapse of the entire building. If a single-column failure could bring the entire building down, it does not matter how that column was removed. If a man-made collapse required extensive preparation to deliberately break every column on multiple floors, then a "natural" single-column failure could not possibly cause rapid, symmetrical, and complete global collapse—straight down in classic controlled-demolition style.

> *Observations for WTC 7 do not match the typical sequence of events for a controlled demolition.*
>
> *This collapse sequence is inconsistent with a typical controlled demolition...*[13]

There are thousands of alert and well-informed citizens worldwide, including scientists, demolition experts, architects and structural engineers, who disagree with the preceding statements. Furthermore, the collapse sequence referred to by NIST is the one taking place during their computer simulation—a sequence of events invisible to witnesses and, to a significant extent, under the control of NIST analysts. There is no need for further speculation; an independent investigation of the incident is required.

Only *fire-induced floor-system failure* was seriously considered by NIST as the cause of collapse initiation. Abundant and well-documented evidence suggesting the controlled demolition of WTC 7—including news videos,

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[9] Therese P. McAllister et al., NIST NCSTAR 1-9, Structural Fire Response and Probable Collapse Sequence of World Trade Center Building 7, Washington: U.S. Government Printing Office, November 2008, p. 323.

[10] NCSTAR 1-9, p. 330.

[11] NCSTAR 1-9, p. 331.

[12] NCSTAR 1-9, pp. 614-15.

[13] NCSTAR 1-9, p. 615.

witnesses hearing explosions, foreknowledge of the collapse, first responder reports of molten metal in the debris, extreme surface temperatures recorded by NASA thermal imaging for weeks following the collapse, and evidence of melted structural steel—was simply ignored.[14] It is difficult to imagine how anyone interested in establishing the likely technical cause of the building failure could ignore evidence of a "liquid eutectic mixture containing primarily iron, oxygen and sulfur formed during this hot corrosion attack on the steel."[15] This was obviously not caused by an ordinary fire consuming only building contents.

## Building Code Issues

NIST discusses building code requirements in effect at the time of construction.[16] The minimum fire-rating requirement for WTC 7 was stated: "For a sprinklered building, a Type 1-C classification required a 2 h fire resistance rating on the columns and a 1.5 h fire resistance rating on the floors."[17] In the same paragraph NIST admits "In this report, Type 1-C classification was assumed, but the actual classification may have been type 1-B." The Type 1-B classification—more restrictive than Type 1-C—required a threehour rating on the columns and a two-hour rating on the floors including girders, beams and the underside of metal deck. Drawings, specifications and spray-on fireproofing thickness measurements all indicated a Type 1-B classification for WTC 7. NIST engineers, however, assumed a less fire-resistant construction classification when all documentation indicated otherwise.

NIST recommended several improvements to building codes including a list of characteristics for infrequent fires that should be considered in structural design.

> *...historical data suggests that infrequent fires which should be considered in structural design involve: ordinary combustibles and combustible load levels, local fire origin on any given floor, no widespread use of accelerants, consecutive fire spread from combustible to combustible, fire-induced window breakage providing ventilation for continued fire spread and accelerated fire growth, concurrent fires on multiple floors, and active fire protection systems rendered ineffective. The fires in WTC 7 involved all of these.*[18]

The statement that fires in WTC 7 included no widespread use of accelerants is unsubstantiated. Extensive documentation in the NCSTAR reports does not indicate that NIST ever tested debris samples for accelerants, incendiary or pyrotechnic compounds following the WTC 7 fires, and such an obvious omission casts serious doubt on their conclusions. In fact, as late as 2009, NIST defended its decision not to test any of the WTC debris for explosive residues claiming that "such testing would not necessarily have been conclusive."[19] Yet such testing might have *been* conclusive. While the National Fire Protection Association publication "NFPA 921: Guide for Fire and Explosion Investigations" counsels caution in interpreting the results of such testing, it does *not* state that such tests are not required if the results *might* be inconclusive. NIST thus chose to remain willfully ignorant as to

[14] See http://www.ae911truth.org for an excellent overview of the evidence.

[15] Barnett et al., FEMA 403, Appendix C, p. C-1.

[16] NCSTAR 1-9, p. 11.

[17] NCSTAR 1-9, p. 12.

[18] NCSTAR 1A, p. 64.

[19] Catherine S. Fletcher, "Letter in response to request for corrections," Journal of 9/11 Studies, July 2009, http://journalof911studies.com/volume/2007/NISTresposeToRequestForCorrectionGourleyEtal2.pdf.

the presence of detectable explosive residues. Its rationale seems flawed, if not disingenuous.

Current building codes require structural design for life safety and stability under normal use and some extreme loading conditions. NIST contends that "current model building codes do not require that buildings be designed to resist progressive collapse."[20] Progressive collapse is defined as "the spread of local damage from a single initiating event, from structural element to element, eventually resulting in the collapse of an entire structure or a disproportionately large part of it."[21] An extensive code change titled "Disproportionate Collapse" was proposed in response to NIST's recommendations, but it was not adopted into the 2009 International Building Code (IBC). *Progressive collapse* has now become the cliche explanation for all three World Trade Center collapses, but this cannot account for the chemical composition of the debris.

## Lateral Ejections from WTC 1

Thousands of people witnessed World Trade Center Tower 1 (WTC 1) collapse suddenly and completely in 10-15 seconds following impact and the subsequent fire. Ample visual evidence is available in the form of photographs and videos taken on 9/11/01, including numerous photographs of the WTC 1 destruction.[22] NIST reports:

> *When WTC 1 collapsed at 10:28:22 a.m., most of the debris landed in an area not much larger than the original WTC 1 building footprint. However, some fragments were forcibly ejected and traveled distances up to hundreds of meters.*[23]

The FEMA report clearly states: "The debris field extended as far as 400-500 feet [120-150 meters] from the tower base."[24] Figure 2-23 of the FEMA report shows an aerial photograph where a significant amount of debris—certainly more than a few fragments—from each tower landed up to a hundred meters away from the tower's base. The NIST discussion of damage caused to WTC 7 by flying debris from WTC 1 includes the following statements.

> *...several substantial pieces of debris were expelled outward toward WTC 7 from the main cloud of the falling material.*[25]

> *...the exterior walls of the towers were constructed from preassembled steel panels consisting of three story columns joined by spandrels to form a 3.0 m wide x 11.0 m high (10 ft x 36 ft) wall section.*[26]

> *The appearance of the falling object in Figure 5-41 suggests that it was formed from at least one panel section.*[27]

A kinematic analysis of this projectile was performed by physics instructor David S. Chandler.[28] His calculations reveal an initial horizontal velocity component of over 70 miles

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[20] NCSTAR 1A, p. 60.

[21] NIST, "Questions and Answers about the NIST WTC 7 Investigation (Updated 12/18/2008)," http://www.nist.gov/public_affairs/factsheet/wtc_qa_082108.html.

[22] NCSTAR 1-9, Ch. 5, Fig. 5-40—5-46, pp. 131-40.

[23] NCSTAR 1A, p. 16.

[24] Ronald Hamburger et al., FEMA 403, Ch.2, "WTC 1 and WTC 2", p. 2-27.

[25] NCSTAR 1-9, p. 130.

[26] NCSTAR 1-9, p. 133.

[27] NCSTAR 1-9, p. 133.

[28] David S. Chandler, "Another High Speed Ejection from WTC 1", See http://www.youtube.com/watch?v=dlwBCEmHrSE.

per hour (nearly 32 meters per second.) Other steel panels were thrown laterally from WTC 1 up to 500 feet (150 meters) to impact the World Financial Center across West Street. The NIST report does not explain the lateral force or energy source capable of hurling a perimeter column/spandrel unit weighing at least 6,000 pounds to impact WTC 7. NIST, therefore, has not established the likely cause of initial damage to WTC 7 on 9/11/01.

## Eyewitness Observations

The NIST account of eyewitness observations contains several glaring contradictions. The following statements imply those remaining inside WTC 7 at 10:30 a.m. had no intention of leaving.

> *By the time WTC 2 collapsed at 9:59 a.m., all the building occupants who intended to leave WTC 7 had done so.*[29]

> *NIST was unable to find any evidence that, by approximately 10:30 a.m., any of the original occupants who intended to leave WTC 7 had not already done so (Chapter 7).*[30]

The preceding statements are false considering the following testimonial evidence.

> *Investigation interviews indicated that this window was broken out by people who were trapped on this floor when WTC 1 collapsed (Chapter 6). Video clips in the database show one of these people inside an open window (8-42A) on the eastern edge of the north face.*[31]

> *As all of the emergency responder restructuring operations were underway, three people became temporarily trapped inside WTC 7. Two New York City employees had gone to the OEM Center on the 23rd floor and found no one there.*[32]

Not everyone had evacuated WTC 7 by the time WTC 1 collapsed. WTC 7 interview numbers 2041604 and 1041704 from 2004 are cited regarding the two New York City employees. The WTC 7 interviews listed in the NIST report have not been released, but Dylan Avery's interview with Barry Jennings, who was trapped inside WTC 7 when both of the Twin Towers collapsed, is available.[33] His personal experience on 9/11 included explosions inside WTC 7 prior to the collapse of WTC 1. This indicates, again, that NIST has not established the likely cause of initial structural damage to WTC 7.

## Impact Damage to WTC 7

The structural damage described by NIST is attributed to flying debris from WTC 1 which was located over 300 feet (90 meters) to the south of WTC 7. The location and extent of damage is especially significant because the horizontal progression of failures during the global collapse sequence reported in NCSTAR 1-9 and 1-9A depends on significant interior damage to the western core structure, even though NIST clearly states that significant damage to the core framing was unlikely. Figures 5-92 through 5-101[34] graphically show the extent of impact damage based on visual data. NIST concludes the following in the summary of debris damage to

[29] NCSTAR 1A, p. 16.
[30] NCSTAR 1-9, p. 297.
[31] NCSTAR 1-9, p. 180.
[32] NCSTAR 1-9, p. 298.
[33] Dylan Avery, "Barry Jennings Uncut", See http://www.prisonplanet.com/barry-jenningsuncut.html.
[34] NCSTAR 1-9, pp. 183-87.

WTC 7:

> *...it is likely that the structural damage (steel and floor slabs) did not penetrate beyond the perimeter of the building core.*[35]

> *...there was relatively little damage to the interior of WTC 7.*[36]

> *WTC 7 withstood debris impact damage that resulted in seven exterior columns being severed...*[37]

> *The structural damage to WTC 7 was primarily located at the southwest corner and adjacent areas of the west and south faces, on Floors 5 through 17. Severed columns were located between Floors 7 and 17 on the south face (six columns) and the west face (one column) near the southwest corner.*[38]

> *The core columns and girders were assumed to be structurally undamaged.*[39]

This summary of structural damage due to debris impact indicates no damage to floor framing in the western core. The following statement regarding the analysis of debris impact and collapse progression from east to west through the core structure demonstrates the contradiction between statements based on visual data and statements based on the analytical model.

> *In the analysis with debris impact damage, the core framing damage on the west side resulted in a more rapid failure of the west interior columns in the last stages of the horizontal progression.*[40]

NCSTAR 1-9 Section 12.4.2 is titled "Building Response to Debris-Impact Damage." This section, however, does not say how the debris-impact damage was estimated. A graphical summary of vertical displacements following application of the impact damage is shown, but there is no discussion of the extent of damaged framing and connections assumed in the analysis. Figure 12-42 shows a "Failure of cantilevered floor framing in debris impact zone, due to accumulated damage in connections."[41] This occurs primarily in line with columns 67-69 (incorrectly labeled 67- 75). Figures 12-48, 12-49 and 12-52 through 12-55[42] also show internal floor failures at the western core around columns 67-69. Finally, Figure 12-57 shows a "Secondary collapse in western core due to early debris damage."[43] The buckling failure of the "Group 7" columns 59, 62, 65 and 68 contradicts the impact damage estimates in NCSTAR 1-9 Chapter 5 as shown in figures 5-92 through 5-101. So what was the source of the western core framing damage that helped the core collapse? The following clue still does not explain this mystery.

> *Damage to the western core developed early in the initialization process as a result of the WTC 1 debris impact damage.*[44]

Figure 4-39[45] shows what appear to be floor

[35] NCSTAR 1A, p. 16.
[36] NCSTAR 1A, p. 16.
[37] NCSTAR 1A, p. 47.
[38] NCSTAR 1A, p. 50.
[39] NCSTAR 1-9, p. 182.
[40] NCSTAR 1A, p. 43.
[41] NCSTAR 1-9, p. 573.
[42] NCSTAR 1-9, pp. 578-83.
[43] NCSTAR 1-9, p. 584.
[44] Robert MacNeill et al., NIST NCSTAR 1-9A, Global Structural Analysis of the Response of World Trade Center Building 7 to Fires and Debris Impact Damage, Washington: U.S. Government Printing Office, November 2008, p. 83.
[45] NCSTAR 1-9A, p. 94.

beams that are severed at mid span, and these beams appear to be supported only by the girder along the southwestern core perimeter. These cantilever beams were noted to cause girder connection failures at column 69 leading to column buckling, but it is not likely that falling debris would sever steel beams as shown in NCSTAR 1-9A Figure 4-39. The questions remain: does the structural model input data correspond to damage estimates documented in NCSTAR 1-9 Chapter 5, and is the input data realistic?

## Fires

NIST states "The fires in WTC 7 were ignited as a result of the impact of debris from the collapse of WTC 1,"[46] but this remains an assumption because there was never a basic fire investigation to determine the exact source or nature of the fires. There were fires reported in WTC 7 after the debris cloud cleared,[47] but these accounts do not pinpoint the initial source of fire. NIST admits that the source of the fire is unknown.

> *The specific ignition processes are not known, e.g., whether from flaming brands, electrical shorts, etc.*[48]

What other possibilities are included in the "etcetera" category? Was arson a possibility? How about evidence of incendiary or pyrotechnic materials found in the debris? Why has NIST neglected to investigate these possibilities? It is apparent that this type of criminal investigation was declared "beyond the scope" of the WTC 7 study, but even NIST cannot determine the most likely cause of building failure without a complete accounting of the facts.

NIST describes the fire simulations performed using their Fire Dynamics Simulator (FDS). The purpose of the fire dynamics simulation is to model the growth, spread and temperature distribution of the fire. The Overview[49] provides no real evidence—photographic, eyewitness or otherwise—leading to a conclusion that the collapse of WTC 1 started the fires on floors seven through nine and 11 through 13. Calculations performed for WTC 7 were similar to those performed for the Twin Towers, but NIST admits "the details of these fires are not as precise as for the fires in the towers."[50] The uncertainty of the calculations based on little visual or other evidence is implied.

> *...the ignition and early course of the fires were unknown because they were presumed to have occurred in the damaged and heavily smoke shrouded southern portion of the building.*[51]

Regarding the spread of fire on the 12th floor, NIST says "The floor plan suggests that fire may have spread onto the east face from the south by moving along a corridor."[52] Corridors in office buildings have practically no combustible materials, so this assumption may be inconsistent with the calculations. Additional photographs and statements magnify the uncertainty in the NIST prediction of fire dynamics. For example the northeast corner of WTC 7 was photographed with the camera facing south at around 4:00 p.m. on 9/11/01. In NIST's words "...there is no indication of fires burning on

[46] NCSTAR 1A, p. xxxvi.
[47] NCSTAR 1-9, p. 301.
[48] NCSTAR 1-9, p. 47.
[49] NCSTAR 1-9, p. 361.
[50] NCSTAR 1-9, p. 362.
[51] NCSTAR 1-9, p. 377.
[52] NCSTAR 1-9, p. 200.

the east side of the 12th floor at this time."[53] The north face at floors 10 through 14 was also photographed at around 4:38 p.m. In NIST's words "All of the visible windows on the 12th and 13th floors are open in Figure 5-149. There is no indication of fire at these locations on either floor."[54] Indeed, all the windows appear dark. NIST also states "Closer inspection of Figure 5-142 reveals what appears to be a relatively light plume of white smoke rising from near the top of the louvers that spanned the 5th and 6th floors on the east face."[55] According to NIST, however, "The floors below Floor 7...did not heat significantly due to the absence of fire activity."[56] So what was the source of the white smoke from below floor seven?

Gas temperatures predicted by the FDS were applied to the 16-story ANSYS structural model and the 47-story LS-DYNA model via the Fire Structure Interface (FSI). Case A temperatures were obtained directly from the fire-dynamics calculations, Case B temperatures were increased 10 percent above Case A, and Case C temperatures were decreased 10 percent below Case A.

> *Given the limited visual evidence, the Investigation Team estimated, using engineering judgment that a 10 percent change was within the range of uncertainty in the extent and intensity of the fires.*[57]
>
> *A 10 percent increase or decrease in gas temperatures resulted in a roughly 30 percent increase or decrease in the heat flux to structural members.*[58]

Engineering judgment is a useful tool, and this enables us to assume Case C temperatures are equally likely as Case A or Case B temperatures. Also by engineering judgment, a 30 percent increase or decrease in heat transfer to structural members is a reasonable approximation based on the probabilistic nature of the NIST analyses. All three cases should have an equal statistical probability considering the fact that Case B and Case C were derived by engineering judgment as a reasonable representation of reality.

The 16-story ANSYS model was subjected to the Case A temperatures, as well as 10 percent higher Case B temperatures and 10 percent lower Case C temperatures. All three cases resulted in similar structural damage to the ANSYS model except the failure time required, as expected, was shorter for the higher Case B temperatures than the failure time required for the lower Case C temperatures. At this point NIST declared:

> *...only the fire-induced damage produced by Case B temperatures was carried forward as the initial condition for the LS-DYNA analysis (Chapter 12), since the damage occurred in the least computational time (about 6 months).*[59]
>
> *The ANSYS results [Case B at four-hour duration] were input to the LSDYNA analysis when it appeared that an initial failure event might be imminent.*[60]

The first statement above implies the reason for choosing Case B temperatures (and discarding

[53] NCSTAR 1-9, Fig. 5-141, p. 227.
[54] NCSTAR 1-9, p. 235.
[55] NCSTAR 1-9, p. 228.
[56] NCSTAR 1-9, p. 394.
[57] NCSTAR 1-9, p. 4.
[58] NCSTAR 1-9, p. 391.
[59] NCSTAR 1-9, p. 6.
[60] NCSTAR 1A, p. 36.

cooler Cases A and C) was for computational efficiency, but the latter statement suggests that an initial failure event may not have occurred in the LSDYNA model without a boost from the fire-induced damage data from the ANSYS analysis. The fire-induced damage estimated from Case B temperatures at four-hour duration were enough to cause an unstable structural model, but the fire-induced damage estimated from Case B temperatures at 3.5 hours was not enough to cause global instability of the LS-DYNA model.[61] It is likely that cooler Case A or C temperatures at four-hour duration would not have led to the prediction of global instability.

> *The simulations of the Floor 12 fires (and thus the derivative Floor 11 and 13 fires) may have overestimated the duration of the fires and the fraction of the burning near the north face windows, relative to the fraction of burning in the interior of the tenant space.*[62]

The LS-DYNA analysis using fire-induced damage estimates resulting from Case B temperatures at 3.5-hour duration did not lead to a prediction of global collapse.[63] An overestimate of fire duration of 1/2 hour (about 12 percent) led to a conclusion supporting global collapse as opposed to a conclusion not supporting global collapse. Also, an overestimate of the fraction burning near the windows must have also led to an overestimate of temperatures due to increased oxygen available near the windows.

> *The floors below Floor 7, Floor 10, and the floors above Floor 14 did not heat significantly due to the absence of fire activity. The exterior columns and core columns also did not heat significantly on the fire floors.*[64]
>
> *The connection, beam, and girder failures in the floor systems, and the resulting structural responses, occurred primarily at temperatures below approximately 400Âã C (750Âã F), well below the temperatures at which structural steel loses significant strength and stiffness.*[65]

None of the column elements in the entire ANSYS model were heated enough to lose any significant strength or stiffness. Nevertheless, NIST claims "The fires thermally weakened Floors 8 to 14."[66] The question remains: Did NIST simply "turn up the heat" on the FDS, ANSYS and LSDYNA analyses to create the global instability necessary to demonstrate a correlation with events observed on 9/11?

## Structural Modeling

NIST created numerous finite-element models for the thermal and structural analyses of WTC 7. These models simulated structural components such as core columns and beam-column connections, subsystems such as partial and full tenant floors, and the global structure. The two global models included (1) the lower 16-story ANSYS model and (2) the 47-story LS-DYNA model. NIST was obviously concerned about obtaining reasonable results under extreme computational demands, and NIST analysts made many simplifying assumptions.

> *Modifications were made to reduce the model size and complexity and enhance computational performance without adversely affecting the*

[61] NCSTAR 1-9A, p. xlvi.
[62] NCSTAR 1A, p. 52.
[63] NCSTAR 1A, p. 42.
[64] NCSTAR 1-9, p. 394.
[65] NCSTAR 1A, p. 53.
[66] NCSTAR 1A, p. 54.

*accuracy of the results.*[67]

NCSTAR 1-9 Section 8.8 describes the finite-element analysis of a partial single-floor framing system bounded by interior column 79 and exterior columns 44, 42 and 38. This is the area blamed for the collapse initiation; this is the subsystem model that predicted failure of shear-studs and girder connections, beam buckling and excessive lateral displacement of a girder at column 79—all triggering collapse initiation. The purpose of this subsystem analysis was to demonstrate "possible failure mechanisms that were used to develop the leading collapse hypothesis further."[68] Girder and beam temperatures were assumed to be 500 degrees and 600 degrees Centigrade respectively, and the slab was assumed to remain unheated.[69]

*No thermal expansion or material degradation was considered for the slab, as the slab was not heated in this analysis.*[70]

Why not? The concrete floor slab could not possibly remain unheated in an atmosphere where steel beams supporting the slab were heated to 600 degrees. The beams were coated with thermal insulation, so the air temperature would have been even hotter than 600 degrees.

*The boundary conditions and temperatures were selected to create maximum shear forces on the stud connectors and beam and girder connections.*[71]

Obviously the NIST partial-floor model did not allow the slab to expand thermally with the steel beams, and neglecting thermal expansion of the slab has the effect of imposing additional relative displacement on the shear studs connecting the concrete to the steel. This subsystem analysis formed the basis for special connection elements used in the global analyses as described in the following passages.

*The failure modes in this model [the partial floor] were incorporated into the 16 story ANSYS and 47 story LS-DYNA analyses.*[72]

*These results helped to guide the development of special connection elements...that captured the salient features and failure modes of the various types of connections used in the floor system of WTC 7.*[73]

NIST states that "even though steel and concrete have similar coefficients of thermal expansion, differential thermal expansion occurred between the steel floor beams and concrete slab when the composite floor was subjected to fire."[74] This relative displacement occurred in the ANSYS model, and no physical testing was done to verify its magnitude in the steel-and-concrete structure. Obviously NIST took steps to maximize the destructive effects of any relative displacement due to thermal movement.

NCSTAR 1-9 Chapter 11 discusses structural analysis of the initial failure event based on the 16-story ANSYS model. Although this model was capable of including thermal conductivity, NIST does not mention this important material property.

*The [ANSYS] model accounted for nonlinear geometric effects, temperature dependent*

[67] NCSTAR 1-9, p. 5.
[68] NCSTAR 1-9, p. 353.
[69] NCSTAR 1-9, p. 349.
[70] NCSTAR 1-9, p. 352.
[71] NCSTAR 1-9, p. 349.
[72] NCSTAR 1-9, p. 353.
[73] NCSTAR 1-9, p. 359.
[74] NCSTAR 1-9, p. 490.

*behavior of members and connections (including thermal expansion and stiffness and strength degradation), the sequential failure of structural framing and connections under fire conditions, and removal of failed elements (with user intervention).*[75]

Heat transfer within structural elements and between structural elements was considerable in the steel framing, and it dissipated heat energy from the hottest parts of the steel. Did the analysts consider heat transfer, or was this property simply ignored to enhance computational performance?

ANSYS results were input to the LS-DYNA model.

*The purpose of the ANSYS model was to simulate the accumulation of local damages and failures up to the initiation of overall global collapse due to fire.*[76]

*The fire-induced damage from the ANSYS model were [sic] input into the LS-DYNA model as initial conditions.*[77]

*...it was not necessary to input more than one solution to the global analysis of the collapse. The fire-induced damage produced by Case B temperatures at 4.0 h was carried forward as the initial condition for the LS-DYNA analysis.*[78]

*Column splices were also not modeled for interior columns, as the purpose of the ANSYS model was to accumulate local failures up to the point of buckling in a column. When column buckling appeared to be imminent, the analyses were continued in the LS-DYNA 47 story model.*[79]

The preceding statements imply that the 47-story LS-DYNA model was initially damaged due to preexisting fire effects, and NIST controlled the initial conditions by using the 16-story ANSYS model to predict an initial failure state for the 47-story model. The LS-DYNA model was loaded with gravity dead loads plus 25 percent of the original design live loads in addition to the high-temperature thermal loading Case B. The initial damage state for the LS-DYNA model included debris impact damage from WTC 1 plus the accumulated fire-induced damage predicted by the ANSYS analysis. Was the LS-DYNA model capable of predicting the initial failure resulting from the Case B temperature distribution without preexisting damage imposed?

NIST enlisted Applied Research Associates (ARA) to provide analytical assistance with the 47-story model of WTC 7. The following statements in the agreement between NIST and ARA[80] demonstrate the nature of the collaboration as it relates to the WTC 7 analyses.

*ARA will conduct analyses, in collaboration with NIST, to determine the location and cause of the initiating event...*

*NIST will conduct all fire analysis of the building and analysis of the structural response to fires in-house and supply ARA initiating event data based on the in-house analyses.*

*The detailed floor analyses will determine likely modes of failure for Floors 8 to 46 due to failure of one or more supporting columns...*

[75] NCSTAR 1-9, p. 457.
[76] NCSTAR 1-9, p. 484.
[77] NCSTAR 1-9, p. 457.
[78] NCSTAR 1-9, p. 535.
[79] NCSTAR 1-9, p. 476.
[80] NIST, "WTC 7 Structural Analysis and Collapse Hypotheses", See http://wtc.nist.gov/solicitations/wtc_award00186.htm.

> *Final analyses will support the determination of the location and cause of the initiating event, by incorporating data from NIST for simulating the initiating event, as well as the location and cause of subsequent failures that led to global collapse.*

NIST supplied the initiating event data even though the contract states that ARA would perform analyses to determine the location and cause of collapse initiation. ARA only looked at failure modes of floors eight through 46 even though previous engineering studies by FEMA engineers stated clearly that "the most likely [structural failure] event would have been the collapse of Truss 1 and/or Truss 2 located in the east end of the 5th and 6th floors."[81] According to the contractual language ARA did not look for possible failure modes on floors one through seven, and the analysis documented by ARA was *required* to support the initiating-event hypothesis as determined by NIST.

The Introduction to NCSTAR 1-9A clearly states the purpose of the LS-DYNA analysis.

> *The purpose of this work was to analyze the global response of WTC 7 to an initial failure event due to fire and to analyze the resulting component and subsystem failures to determine the events that led to the global collapse.*[82]

The initial failure event was predetermined by NIST. ARA was not responsible for analysis of the structural response to the fires and varying temperature distribution from the start, although LS-DYNA is capable of analyzing thermal softening and thermal expansion of structural materials. NCSTAR 1-9A also states the LS-DYNA model of WTC 7 "was focused on capturing the entire collapse initiation and collapse propagation process of the building..."[83] This is clearly false; the LS-DYNA model of WTC 7 was initialized with data representing fire-induced damage that NIST estimated had occurred leading to collapse initiation.

A two-floor subassembly model was constructed by ARA to "assess the model behavior for failure events during the model development and to assess the global model performance..."[84] Two temperature profiles were considered during the two-floor model analyses. These are described as Case A and Case B *at five hours*,[85] but NCSTAR 1A and NCSTAR 1-9 discuss only temperature profiles with 3.5-hour and four-hour duration. The final reports are inconsistent with respect to this important detail.

ARA analyzed their two-floor model with several specific load cases in conjunction with the Case A and Case B temperatures at *five-hour duration*. Load Case 1 had no imposed (preexisting) connection or support failures.[86] The Case A temperature distribution did not lead to instability of the floor structure. The Case B temperature distribution predicted a partial collapse of the framing, but this did not occur at the east end of the building as predicted by the ANSYS analysis. Only Load Cases 2 and 3 exhibited a partial collapse at the east end of WTC 7, and these load cases imposed *preexisting* failures of connections at columns 79 and 81. Not one of

[81] Gilsanz et al., FEMA 403, Ch. 5, p. 5-28.
[82] NCSTAR 1-9A, p. 1.
[83] NCSTAR 1-9A, p. 1.
[84] NCSTAR 1-9A, p. 64.
[85] NCSTAR 1-9A, p. 65.
[86] NCSTAR 1-9A, p. 70.

the three load cases predicted a collapse of floor framing at the northeast corner as predicted by the ANSYS model—the event described by NIST as causing collapse initiation.

ARA also constructed a 14-story model that was used to evaluate the structural response to debris impact damage.[87] The subassembly model was determined to be stable following impact damage. The 14-story model was also used to evaluate the response to removal of column 79 support. The abrupt removal of support resulted in a vertical progression of collapse of all 14 floors at the northeast corner—no surprise. Also no surprise is the fact that it did not lead to a horizontal progression of failures resulting in complete collapse of the 14-story model. Unfortunately ARA did not include results or discussion of their 14-story model subjected to Case A and Case B temperature distributions *without any imposed damage to framing and connections* as they did with their two-story model. It would be helpful to know if the 14-story LS-DYNA model experienced similar results as the two-story model, or if fire-induced failures were predicted similar to the 16-story ANSYS model. Why was this important comparison and verification omitted from the report?

The 47-story LS-DYNA model is impressive with nearly 3,600,000 node points, over 3,000,000 shell elements, over 33,000 nonlinear spring elements, over 3,000 beam elements and nearly 2,500 solid elements.[88] The global model included gravity effects from 25 percent of the design live load. This is reasonable for office areas with a design live load of 50 pounds per square foot (psf), but it may overestimate gravity effects in areas such as corridors, lobbies and other public areas that were evacuated on 9/11/01 and had no furniture, files or other miscellaneous weight to account for. Original design loads for WTC 7 are listed in Figure 11-17;[89] floors one through six and 21 through 23 were designed for live loads exceeding 50 psf. Floors supporting switchgear and mechanical equipment, such as floors five and six, are frequently designed for live loads of 100 psf or greater. But the lobbies, conference center, meeting spaces, and cafeteria located on floors one through four had practically zero live load on the afternoon of 9/11/01. Floors 21 through 23 were offices and also were evacuated.

The loads applied to the LS-DYNA global model included gravity, debris impact damage, Case B temperatures (applied smoothly in two seconds), and fire-induced damage from the ANSYS analysis.[90]

> *In the model, the debris damage was instantaneously applied to approximate the actual dynamic event.*[91]
>
> *The final step in the initialization process was to apply fire-induced damage from the 16 story ANSYS analysis.*[92]
>
> *...the fire-induced damage obtained from the 16-story ANSYS analysis, including damage to floor beams, girders, and connections, was applied instantaneously.*[93]
>
> *Any imposed structural damage was applied instantaneously immediately following*

[87] NCSTAR 1-9A, p. 73.
[88] NCSTAR 1-9A, p. xxxvi.
[89] NCSTAR 1-9, p. 485.
[90] NCSTAR 1-9, p. 563.
[91] NCSTAR 1-9A, p. 83.
[92] NCSTAR 1-9A, p. 118.
[93] NCSTAR 1-9A, p. 51.

*temperature initialization.*[94]

The elevated temperatures and fire-induced damage to structural elements occurred over a period of several hours, and sudden removal of damaged structural elements does not account for a gradual redistribution of static loads. Thermal conductivity and heat flux affect the temperature distribution as a function of time. What effect does the rate of application of heat and fire-induced damage have on the global analysis? This is one more question the report does not address.

Damage to framing and connections was taking place in the LS-DYNA analysis prior to the application of the ANSYS estimated damage.

> *During the temperature application cycle in the LS-DYNA analysis, combined thermal expansion and thermally degraded material properties resulted in beam and girder connection damage throughout the heated floor structures. The connection damage and buckled beam data transferred from the 16 story ANSYS analysis were then applied.*[95]

If the application of elevated temperatures were sufficient to cause framing and connection damage throughout the floor structures, and the LS-DYNA analysis considered thermal expansion and thermally-degraded material properties, then why was it necessary to impose additional fire-induced damage determined by the NIST ANSYS analysis?

Models of framing connections used in the LS-DYNA analysis were compared to the ANSYS connection models.

> *A comparison was performed between the LS-DYNA and ANSYS FHK [fin, header, and knife] shear connection models. The comparison showed good agreement for selected connections, which increased confidence in both of the separately developed modeling approaches.*[96]

What is considered "good agreement", and what about connections other than the "selected connections"? NIST does not show any documentation of this comparison. NCSTAR 1-9A Figure E-2 shows the elements of a seated connection model.[97] This connection model appears to have the necessary components for prediction of connection performance and any failure due to thermal stresses. So why does the LSDYNA global analysis depend on the 16-story ANSYS analysis performed by NIST to predict the fire-induced damage to framing members and connections? NIST attempts to explain this procedure.

> *The ANSYS analysis estimated the damage that occurred as the fires grew and spread on Floors 7, 8, and 9 and Floors 11, 12, and 13. The LSDYNA analysis, by comparison, considered only a temperature profile at the time when thermally-induced damage was transferred from the ANSYS analysis.*[98]

This does not explain why the LS-DYNA analysis was not started cold and allowed to develop the thermally-induced damage from data provided by the NIST fire simulation. Not only does the LS-DYNA temperature profile go from zero to nearly 500 degrees Centigrade in two seconds, but the thermal damage estimated by NIST occurred

[94] NCSTAR 1-9A, p. 65.
[95] NCSTAR 1-9A, p. 79.
[96] NCSTAR 1-9, p. 555.
[97] NCSTAR 1-9A, p. xxxvii.
[98] NCSTAR 1-9A, p. xxxix.

gradually over several hours, and it was applied to the structural model instantaneously. This is not credible for a structural model used to predict the response and interaction of structural materials with time and temperature-dependent properties.

NIST compared visual observation times and analytical prediction times of various events leading up to and including the global collapse. The first entry in Table 3-1 of NCSTAR 1A indicates an observation time of minus six seconds for the cascading floor failures that preceded the buckling failure of column 79. This "event" was not observed by NIST or anyone else, so the table is erroneous to imply that it was observed before column buckling or the start of global collapse. The buckling of columns 79 through 81 and the horizontal progression of core column buckling were also not observed events as clearly shown in the table.

A significant discrepancy is obvious in the last two observations listed in Table 4-2 of NCSTAR 1-9A. These include the vertical motions of the roof-mounted screen wall (between the east and west penthouses) and the west penthouse. Visual observations clearly show the screen wall falling prior to the west penthouse. The global LS-DYNA model (including debris impact damage) indicates the west penthouse falling out of sequence prior to the screen wall, and NIST falsely claims "the simulation closely matched the observed behavior."[99] This is related to the column failures in the western core that occurred out of sequence in the global model. How do ARA and NIST explain this discrepancy?

Figures 4-13 and 4-14 of NCSTAR 1-9A illustrate the 47-story model during collapse progression. These figures are viewed from the northeast rather than the northwest as labeled, and they indicate significant distortion in the upper stories that were not apparent in any of the photographs or videos taken during the event on 9/11.

> *This behavior created numerical difficulties in the analysis, which were not likely to occur in the structure.*[100]

The "behavior" referred to above is the torque applied to spandrel beams from "softened" slab elements that carried floor live loads but had reduced stiffness. In some cases the supporting beam elements had failed and had been removed from the analysis. How many other numerical difficulties were encountered in the complex finite-element models that were not likely to occur in the steel and concrete structure?

> *Computer simulations...can be used to predict a complex degradation and collapse of a building.*[101]

This may be true, but computer simulations—regardless of their complexity—cannot replace an honest and complete forensic investigation of the collapse site and debris. As Professor E.L. Wilson points out with regard to computer simulations: "Remember the result obtained from a computer model is an estimation of the behavior of the real structure. The behavior of the structure is dictated by the fundamental laws of physics and is not required to satisfy the building code or the computer program's user manual."[102]

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[99] NCSTAR 1-9A, p. 120.

[100] NCSTAR 1-9, p. 489.

[101] NCSTAR 1-9, p. 625.

[102] Edward L. Wilson, Three Dimensional Static and Dynamic Analysis of Structures, Berkeley: Computers and Structures, Inc., 3rd Ed., April, 2000, p. 1-14.

## Structural Details

Most engineers involved with building design and construction know that structural details are critical to the success of a project. It was common practice on the east coast when WTC 7 was built for the steel fabricator's detailer to design the framing connections using the Manual of Steel Construction, Eighth Edition, 1980 by the American Institute of Steel Construction (AISC). It was then the engineer's responsibility to review the detailer's shop drawings, including connection details, for conformance with the structural design.

NCSTAR 1-9 Figures 12-13 and 12-14 show schematic details of composite-floor construction at interior beams and girders. NIST concluded that the W33x130 girder spanning between exterior column 44 and interior column 79 had no shear studs to provide composite action with the concrete floor slab.[103] Although composite action was not required for the girder to carry its vertical floor load, good detailing practice would include shear studs if they were used elsewhere on the floor. Figure 12-14 shows a double row of studs on the interior girder, but refers to the framing plan for more information.[104] No shear studs were indicated for the girder on a partial framing plan,[105] and this was interpreted by NIST to mean no shear studs were provided. But simply omitting the number of studs from the structural framing plan does not prove that shear studs were not present on the interior girders. They could have been specified in written notes or specifications located elsewhere. Structural plans, and even fabrication drawings, do not always accurately reflect the existing construction; an examination of the steel debris before it was removed and destroyed would have answered this question.

Figure 8-21 of NCSTAR 1-9 shows the connection at column 79 supporting the W33x130 girder that spanned between columns 44 and 79. This column had three girders framing into it, but NIST says:

> *The details of the connections of the other two girders are not shown.*[106]

Why not? The other two girders also provided lateral bracing for column 79, and the connection details are important.

Damage to framing connections from the ANSYS analysis was applied to the LSDYNA model as shown in NCSTAR 1-9 Figure 12-36 (and in NCSTAR 1-9A Figure 3-58.) A 100 percent failure state was assumed to occur for any calculated damage over 75 percent. The report says this assumption was made due to "the coarseness of the shell element modeling of the fin, knife, and header connections in the LSDYNA model..."[107] Residual connection strength of 25 percent of the original strength, however, is substantial considering the safety factor used to ensure adequate design. This illustrates another simplification assumed by NIST in favor of a progressive collapse.

> *W14x730 refers to wide flange section that is nominally 14 in. deep end [sic] weighs 730 lb/ft.*[108]

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[103] NCSTAR 1-9, p. 342.
[104] NCSTAR 1-9, p. 543.
[105] NCSTAR 1-9, p. 343.
[106] NCSTAR 1-9, p. 348.
[107] NCSTAR 1-9, p. 566.
[108] NCSTAR 1-9, p. 29, footnote 2

Actually a W14x730 wide-flange column is over 22 inches in depth with a three-inch thick web and five-inch thick flanges nearly 18 inches wide. This is the heaviest rolled steel section listed in the AISC Manual of Steel Construction, Eighth Edition. NIST grossly understates the size of these massive columns by implying a 14-inch depth.

## The Initiation Event

Failure of the floor framing at the east end of floor 13 was blamed for initiating the series of events that led to complete collapse. A discussion of existing floor plans and combustibles includes the following statement:

> *...there was some uncertainty regarding the nature of some spaces. Notably, the U.S. Securities and Exchange Commission (SEC) and American Express occupied all but the east side of the 13th floor, and NIST was unable to find people who recalled the nature of the unoccupied space.*[109]

It is unlikely that those who managed the tenant spaces of this 47-story office building could not recall, or could not find out, who or what occupied the specific location where the collapse initiation was said to occur. Apparently NIST did not use their subpoena power to obtain this information from the building owner.

According to NIST the floor framing failed as a result of several factors including failure of shear studs, buckling of beams, and "walk off" of girders due to unrestrained thermal expansion of perpendicular beams.

> *At this temperature [greater than 300 .C.] in the shear studs, differential thermal expansion of the floor beams and floor slab resulted in significant shear force in the shear studs and caused them to fail.*[110]

> *Primarily for the east tenant floor, when a floor beam thermally expanded, the beam displaced the girder at the interior end of the floor beam but did not displace the exterior frame at the other end of the floor beam.*[111]

> *Many of the east floor beams on Floors 12, 13, and 14 failed by buckling, as shown in Figure 11-27 and Figure 11-35.*[112]

NIST implies a restrained (pinned) support condition at the exterior frame and an unrestrained (roller) support condition at the interior girder. If the beams are unrestrained at one end, how can they develop the compressive force necessary for buckling to occur? Alternatively, how can the beams push the girder laterally if they have buckled in compression?

Reasons listed for the loss of lateral support to columns 79 through 81 include the following.

> *The buckling failure of the east floor beams and exterior columns was caused by restrained thermal expansion and failure of the shear studs along the beam length.*[113]

It is not clear what buckling failure of exterior columns is referred to in the preceding statement, and NIST previously stated ...the beam displaced the girder at the interior end of the floor beam but did not displace the exterior

[109] NCSTAR 1-9, p. 48.

[110] NCSTAR 1-9, p. 473.
[111] NCSTAR 1-9, p. 526.
[112] NCSTAR 1-9, pp. 526-27.
[113] NCSTAR 1-9, p. 537.

frame at the other end of the floor beam."[114] If thermal expansion of the floor beams did not displace the exterior frame, then buckling of exterior columns would not occur.

> *The connection, beam, and girder failures in the floor systems, and the resulting structural responses, occurred primarily at temperatures below approximately 400°C (750°F), well below the temperatures at which structural steel loses significant strength and stiffness.*[115]

> *The thermal expansion of the WTC 7 floor beams that initiated the probable collapse sequence occurred primarily at temperatures below approximately 400°C (750°F).*[116]

Unrestrained thermal expansion of 52-foot long beams was blamed for pushing a girder off its bearing seat at column 79. This linear expansion is about 3.5 inches at 400°C, but this is a full two inches short of the 5.5-inch lateral displacement required for loss of vertical support. "Walk off" is the term NIST used to describe the failure mode where a beam or girder moved axially or laterally off its bearing seat losing all vertical support. The walk-off failure was assumed to be complete when lateral displacement of the beam or girder end moved past the point at which the beam web was aligned vertically with the edge of the bearing seat.[117] One of the least "state-of-the-art" features of the complex analysis performed by NIST is the means by which they accounted for the lateral walk-off failure of the girder at column 79, and convincing documentation of this triggering failure mode is nonexistent.

> *A control element (COMBIN37), a unidirectional linear spring element with the capability of turning on and off during an analysis, was used to model walk-off.*[118]

> *The travel distance for walk off was 6.25 in. along the axis of the beam and 5.5 in. lateral to the beam.*[119]

Since the COMBIN37 element could only account for displacement in one direction (axially), what accounted for displacement in the lateral direction?

> *A control element was used to model beam walk-off in the axial direction. Beam walk off in the lateral direction was monitored during the analysis.*[120]

*Monitored by what*? NIST summarized the floor framing failures that led to collapse initiation, and *lateral* girder walk off at columns 79 and 81 was the failure mode allegedly responsible for the start of collapse.[121] Where are the analytical results that substantiate walk-off failures at columns 79 and 81? Where is the output data from the ANSYS analysis that confirms the lateral walk-off failures? A recent Freedom of Information Act (FOIA) request to NIST for analysis results that substantiate the walk-off failures was denied with the statement that "The NIST Director determined that the release of these data might jeopardize public safety."[122]

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[114] NCSTAR 1-9, p. 526.
[115] NCSTAR 1A, p. 53.
[116] NCSTAR 1A, p. 59.
[117] NCSTAR 1-9, p. 488.
[118] NCSTAR 1-9, p. 480.
[119] NCSTAR 1-9, p. 482.
[120] NCSTAR 1-9, p. 482.
[121] NCSTAR 1-9, p. 536.
[122] See http://cryptome.org/wtc-nist-wtc7-no.pdf.

## Collapse Progression

The exterior steel moment-resisting frame encompassed WTC 7 with 58 perimeter columns. Apparently all of these columns had to buckle within two seconds for the building to drop unimpeded straight down as seen in the video documentation.

> *Exterior column buckling began at Column 14, adjacent to the debris impact zone near the southwest corner, between Floors 10 and 12.*[123]

> *Exterior column buckling spread from column to column, as loads were redistributed, until all the exterior columns had buckled between Floors 7 and 14 within approximately 2 s.*[124]

Are the preceding statements describing the actual event on 9/11, and are they confirmed by witnesses, or are they simply statements describing the NIST computer simulations?

> *In the analysis with debris impact damage, the core framing damage on the west side resulted in a more rapid failure of the west interior columns in the last stages of the horizontal progression.*[125]

There was no core framing damage on the west side according to NCSTAR 1-9, page 182.

NCSTAR 1-9 Section 12.5.2 is titled "Aspects Following the Collapse Initiation." The NIST authors' style is exemplified in the first paragraph of this section with the following illumination.

> *Once simulation of the global collapse of WTC 7 was underway, there was a great increase in the uncertainty in the progression of the collapse sequence, due to the random nature of the interaction, break up, disintegration, and falling of the debris. The uncertainties deriving from these random processes increasingly influenced the deterministic physics-based collapse process, and the details of the progression of the horizontal failure and final global collapse were increasingly less precise.*[126]

The preceding statement by NIST implies that complete and rapid internal and external collapse was inevitable based on a computer simulation without any physical testing. Details of the actual collapse initiation, vertical progression and horizontal progression were not visible and have not been established by NIST based on any physical evidence, so "increasingly less precise" can only mean *unknown*.

NIST's summary of findings states:

> *The horizontal progression of failure was sensitive to the extent of the estimated initial structural damage in WTC 7 due to debris impact from the collapse of WTC 1.*[127]

It describes how several columns in the western core lost lateral support in the north-south direction from debris impact damage and buckled prior to failure of the central core columns. This sequence of events differed from the analysis without debris impact damage imposed. The latter analysis correlated with the actual observed sequence of the roof screen wall falling prior to the west penthouse structure. The "best estimate analysis" which included debris impact damage did not correlate with the

[123] NCSTAR 1-9, p. 586.
[124] NCSTAR 1-9, p. 588.
[125] NCSTAR 1-9, p. 599.
[126] NCSTAR 1-9, pp. 599-600.
[127] NCSTAR 1-9, p. 606.

observed sequence of events at the roof level.

> *This suggests that the damage scenario that was imposed in the best estimate analysis was slightly more severe than actually occurred.*[128]

How true, and the impact damage estimate described previously included no core damage at all. The description "slightly more severe..." may be another understatement by NIST, and an overestimate of impact damage undoubtedly favors collapse progression.

> *The initial westward progression and the overall speed of the collapse was [sic] not sensitive to the extent of the estimated structural damage to WTC 7 due to the debris from the collapse of WTC 1.*[129]

But:

> *The horizontal progression of failure was sensitive to the extent of the estimated initial structural damage in WTC 7 due to the collapse of WTC 1.*[130]

So which one is correct?

## Free-fall Acceleration

Kinematic analysis of videos taken of the global collapse proves that the north face, the east face and the entire building descended at free-fall acceleration for 2.25 seconds spanning a height of eight stories.[131]

> *...the north face descended at gravitational acceleration, as the buckled columns provided negligible support to the upper portion of the north face.*[132]

> *Global collapse occurred as the entire building above the buckled region moved downward as a single unit.*[133]

> *In Stage 2, the north face descended at gravitational acceleration, as exterior column buckling progressed and the columns provided negligible support to the upper portion of the north face.*[134]

Gravitational acceleration—or free-fall acceleration—implies zero resistance was provided by the structural elements below the free-falling mass. If free-fall acceleration is defined such that all available potential energy is converted to kinetic energy in unrestrained motion, then what additional energy was available—and necessary—to yield and fracture multiple supporting steel framing members and connections as the collapse progressed? NIST does not account for this energy requirement during this 2.25-second period in their analyses. NIST simply dismisses this anomaly by saying it was consistent with the global collapse analysis. This brief dismissal is neither convincing nor complete documentation for an authoritative and

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[128] NCSTAR 1-9, p. 606.

[129] NCSTAR 1-9, p. 625.

[130] NCSTAR 1-9, p. 612.

[131] Chandler, "WTC 7 in Freefall—No Longer Controversial" is located at http://www.youtube.com/watch?v=rVCDpL4Ax7I. Chandler, "WTC 7: NIST Finally Admits Freefall (Part I)" is located at http://www.youtube.com/watch?v=eDyNS9iMizA. Chandler, "WTC 7: NIST Finally Admits Freefall (Part II)" is located at http://www.youtube.com/watch?v=iXTlaqXsm4k. Chandler, "WTC 7: NIST Finally Admits Freefall (Part III)" is located at http://www.youtube.com/watch?v=v3mudruFzNw.

[132] NCSTAR 1A, p. 45.

[133] NCSTAR 1A, p. 48.

[134] NCSTAR 1-9, p. 602.

comprehensive report, and it is not acceptable by any reasonable standard of care.

## Steel Debris

NIST writes:

> *...that the building and the records kept within it were destroyed, and the remains of all the WTC buildings were disposed of before congressional action and funding was available for this investigation to begin. As a result, there are some facts that could not be discerned and, thus, there are uncertainties in this accounting.*[135]

The building had been completely evacuated several hours before its collapse. No one was trapped in the debris pile, so there was no need to rapidly dismantle and destroy the steel debris. Why was the structural steel disposed of before a proper investigation? Who authorized the disposal of the steel before it could be adequately observed and documented? What are the uncertainties in NIST's accounting that resulted from the disposal of the steel framing, and how has NIST compensated for these uncertainties?

The NIST hypothesis was based, in part, on a "critical study of steel framing" from WTC 7.[136] The NIST report, however, does not attempt to explain the "severe high-temperature corrosion attack" on several WTC steel samples as documented in Appendix C of the FEMA report.[137] A detailed study was recommended by FEMA, but the observed "intergranular melting" of the steel was never reconciled by NIST. If NIST has performed the recommended studies, then why have the results not been published? Otherwise, why has NIST ignored the recommendations made in 2002 for critical research of the unexplained material behavior?

## Conclusion

After reading and studying NCSTAR 1A, 1- 9 and 1-9A, technical professionals and others must ask themselves several questions.

1. Has NIST followed accepted scientific protocol in its analysis procedure considering all available physical and testimonial evidence?

2. Has NIST presented its hypotheses, analyses and conclusions with clarity, transparency and completeness?

3. Has the NIST documentation answered all of your questions regarding WTC 7?

4. Would you endorse the NIST report?

The NIST analyses demonstrated that it may be possible, under certain unlikely circumstances, for ordinary fire effects to cause severe damage and partial collapse of a high-rise steel structure. NIST has, however, focused entirely on the fire-induced collapse hypothesis and has ignored relevant facts and evidence that lead to a contrary conclusion regarding the *most likely* cause of collapse. It is obvious that NIST engineers were primarily concerned with providing an explanation of what "may have happened" rather than an explanation of the *most likely* cause of collapse considering all relevant data and evidence. The NIST analyses fail to provide a convincing explanation of events

[135] NCSTAR 1A, p. xxxv.
[136] NCSTAR 1A, p. 25.
[137] Barnett et al., FEMA 403, Appendix C.

observed on 9/11 and in the days and weeks following. Specifically NIST has failed to explain evidence of *extreme* temperatures[138] and the presence of highly reactive pyrotechnic materials discovered in the debris.[139] The NIST analyses, therefore, have not fulfilled the legal requirement—as stated in the NCST Act of 2002—to determine the *most likely* cause or causes of the collapse.

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[138] Jones et al.

[139] Harrit et al.

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